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OCEAN OF ĀYURVEDIC PHARMACEUTICS

Dr. K. Rama Chandra Reddy

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OCEAN OF ĀYURVEDIC PHARMACEUTICS

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an of Āyurvedic Pharmaceutics

BY

Dr. K. Rama Chandra Reddy

Ve are happy to bring out the English n of *Ocean of Āyurvedic Pharmaceutics.* ook is a boon for *Āyurvedic Graduates* ll as post graduates of *Āyurveda.* The mainly deals with *Rasa Śāstra* and *jya Kalpanā,* covers the Syllabus of I.S. and M.D. Course out lined in the *Rasa Śāstra* and *Bhaṣajya Kalpanā* of entral Council for Indian Medicine M).

he basic fundamentals of *Rasa Śāstra* *haṣajya Kalpanā* are explained with fic explanation in a nice manner in ook, apart from this, the book also the relevant modern pharmaceutical ation and Dr. Reddy tried to bring the practical aspects of *Rasa Śāstra* and *jya Kalpanā* with scientific explana-

he English version of this book will w dimension to the popularity and the of this branch of knowledge in the

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लेखक Reddy, Ramachandra
शीर्षक Ocean of Ayurvedic Pharmaceutics

दिनांक	सदस्य संख्या	दिनांक	सदस्य संख्या

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THE
CHAUKHAMBHA SANSKRIT BHAWAN SERIES
71

OCEAN OF ĀYURVEDIC PHARMACEUTICS

(Illustrated)

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December 27, 2006

FOREWORD

It is with immense pleasure that I write this foreword to the book *Ocean of Ayurvedic Pharmaceutics* written by Dr K. Ramachandra Reddy. Many scholars agree that the origin of the science of Ayurveda in India can be traced from *Vedas* , which were infact said to be the evidences of Indus valley civilization. Man identified many things from his surroundings, in this series, various medicines have been explored. Ayurveda, is the Ancient Indian Medical Science, is rapidly gaining global acceptability as a highly effective Healthcare system. It is one of the most complex and intellectually challenging among professional pursuits, demanding as Medicine with the advancements and needs of the current era. The majority of the population in the country depends on drugs of indigenous origin. It is therefore necessary that more books should come out in Ayurveda. Time has changed and advances have to be made accordingly, without comprising the fundamentals of Ancient knowledge. New concepts may be introduced to enrich the science as well as to contribute to current Healthcare challenges.

Ras Shastra and Bhaishajya Kalpana is one of the important branch of Ayurveda, which deals with all the aspects of Ayurvedic drug manufacturing. *Ocean of Ayurvedic Pharmaceutics* which deals with all the aspects of the subject Ras Shastra and Bhaishajya Kalpana is an appreciable and unique effort. The author has tried to bring the subject of Ras Shastra and Bhaishajya Kalpana in a lucid language and by incorporating all the curriculum of the subject given by Central Council of Indian Medicine for BAMS, MD Course and also the syllabus of B-Pharm.(Ayurveda).It describes most commonly accepted formulations with complete details. All the information of Ayurvedic drug manufacturing is collected at one place, codified and arranged in a systematic way, being spelled under suitable relevant headings. Thus this work deals with all the relevant and important aspects Ras Shastra and Bhaishajya Kalpana by mentioning Plant, Animal, Metal/Mineral drugs, their usage, time – season and place of their collection, weights and measures, pharmaceutical processing methods with their technicalities etc.

This is a humble effort to generate such an interest to wards practical knowledge in the Ayurvedic drug manufacturing. I am sure, this English version of *Ocean of Ayurvedic Pharmaceutics* by Dr.Reddy will serve the need of the students, the Pharmaceutical personal and others involved in *Ayurvedic* drug manufacturing.

I wish him all success for writing such type of book in *Ayurveda*.

(Panjab Singh)

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FORWORD

Ocean of *Āyurvedic Pharmaceutics* is composed basically for the purpose of providing information related to *Rasaśāstra* and *Bhaiṣajya Kalpanā*.

This book describes all the aspects of *Rasaśāstra* and *Bhaiṣajya Kalpanā* and popular *Āyurvedic* formulations contained in the various texts and their various forms and combination along with their usage and other manufacturing details. It also describes the each drug of *Rasaśāstra* Besides, there is a detailed description of *Kalpanās* with special reference to their practical aspects of manufacturing including fundamental aspects of *Bhaiṣajya Kalpanā*. It is discussed that all important aspects of manufacturing. It became more informative because of some addition from latest research aspects and advancement of technology in the subject concerned. Apart from this different methods which will facilitate the purpose of practical convenience of medicine preparation are also discribed.

I am sure that this edition definitely serves the needs of the students, research scholars, the personal related to teaching profession of the subject and pharmacy. The work is essential and useful since the increasing demand of the *Āyurvedic* medicines in India and abroad.

The distinct description such as *Rasaśāstra* and *Bhaiṣajya Kalpanā* etc. and also different practical aspects of *Āyurvedic* drug manufacturing are nicely described in this book. It also contains the list of formulations which gives details regarding the ingredients with quantity, method of preparation and therapeutic uses etc.

It is a good collection of latest research aspects and important verses from early reputed treatises. The present attempt is the first in this direction from the *Rasaśāstra* and *Bhaiṣajya Kalpanā* is concerned. The subject matter is incorporated on the basis of CCIM syllabus. It is proof of its usefulness, that the inquisitive welcome the work with interest and enthusiasm. The main aim of the *Ocean of Āyurvedic Pharmaceutics* is to make close acquaintance with *Āyurvedic* medicine manufacturing.

I am sure this book will soon become very popular and will have a grand success.

Prof. Gajendra Singh

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FOREWORD

I am happy to write a foreword to the book entitled *Ocean of Ayurvedic Pharmaceutics* written by Dr K. Ramachandra Reddy who is working as a Reader, in the Deptt. of Rasa Shastra, Faculty of Ayurveda, IMS, BHU.

Ayurveda is one of the oldest systems of healing. The secret of its vitality lies in its inherent capability to interact with other disciplines.Ayurveda in its long journey had faced many challenges, passed through difficult phases and yet it could stand the test of time without compromising on its basic principles.The process of evaluation will continue as long as Ayurveda remains a living tradition. As Ayurvedic medicines are gaining global attention and popularity. In this direction the English version of *Ocean of Ayurvedic Pharmaceutics* would certainly be useful.

The *Ocean of Ayurvedic Pharmaceutics* deals with the subject Rasa Shastra and Bhaishajya Kalpana which is an important branch of Ayurveda related with Ayurvedic drug manufacturing.An attempt has been made to explain all parts of Ayurvedic drug maunfacturing including practical perspectives. The book covers the syllabus of the subject Rasa Shastra and Bhaishajya Kalpana given by CCIM for BAMS and MD course. The book also mentions about many relevant Ayurvedic formulae with complete details.

Number of diagrams, tables and illustrations have been included wherever required for better understanding of the subject. The distinct description of important aspects of Ayurvedic drug manufacturing including their practical aspects are nicely described in this book. Author has reviewed various treatises in presentation of the book.

I hope this edition definitely serves the requirement of the students, research scholars, personal related to the Ayurvedic Pharmacies and teachers. This type of work is really the need of the hour and will make it easier for the students to learn and understand the subject.

I congratulate the young author for this work in bringing out this for the benefit of the student community.

I wish the young author a bright future.

Vasanta Panchami Date : 23-1-2007

Prof. Manjari Dwivedi
Dean
Faculty of Ayurveda,
Institute of Medical Sciences
BHU, Varanasi.

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FOREWORD

I feel immense pleasure to go through this treatise *Ocean of Ayurvedic Pharmaceutics* written by Dr K. Ramachandra Reddy, working as a Reader, in the Deptt. Of Rasa Shastra, Faculty of Ayurveda,IMS,BHU.Ayurvedic compound formulations are divided into two groups viz. a) Rasaushadhi (Predominantly metals and minerals) dealt in Rasa Shastra, b) Kashtaushadhi (Predominantly plant drugs) dealt in Bhaishajya Kalpana.The book entitled *Ocean of Ayurvedic Pharmaceutics* covers the subject Rasa Shastra and Bhaishajya Kalpana.

The author has tried to bring the subject of Rasa Shastra and Bhaishajya Kalpana in a nice language and by incorporating all the curriculum and syllabus of the subject given by CCIM for BAMS and MD course. The book covers about many important formulae as examples and mentioned the complete details including the practical ways of overcoming the difficulties wherever found out. All the information of Rasa Shastra and Bhaishajya Kalpana is compiled, codified and arranged in a systematic way and presented under suitable relevant headings.

Ocean of Ayurvedic Pharmaceutics incorporating most of the information related to metal, mineral, animal and plant drugs of Ayurveda with their pharmaceutical processing including their technicalities etc. It is an important and major source book which is related with the Rasa Shastra and Bhaishajya Kalpana.Throughout the book care has been taken and the subject is presented in such a way that the fundamentals of the subject will be understood easily. This book fills the gap admirably. More over there has been good explanation with comparison of contemporary sciences with easy and good understanding language.

Those who wish to under take an intimate and advanced study of Rasa Shastra and Bhaishajya Kalpana and, to an extent ,even of Ayurveda as a whole, will find it profitable perhaps even indispensable, to make a serious study of contents of this treatise. I am sure this book will be useful to the students, teachers and research workers in Ayurveda in general and Rasa Shastra and Bhaishajya Kalpana in particular in India and also abroad. This provides a vast unexplored field for research to scientists. I consider it a creditable achievement. It is particularly so when the text he has handled is as important and as extensive.

I congratulate the young author and I bless him for his prosperity in the life ahead.

Vasanta Panchami
Date : 23-1-2007

Prof. Chandra Bhushan Jha
Ex. Head, Deptt. of Rasa Shastra,
Ex. Superintendent, Ayurvedic Pharmacy,
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PREFACE

I am happy to bring out the English Version of *Ocean of Āyurvedic Pharmaceutics*. I have ventured to write this book which covers the syllabus of B.A.M.S. out lined in the paper *Rasaśāstra* and *Bhaiṣajya kalpanā* and M.D. Course. The vast majority of the population in the country depend on drugs of indigenous origin. It is, therefore necessary that, more books should come out in this subject. Collection of literature related to *Rasa Śāstra* and *Bhaiṣajya Kalpanā* helps for producing good quality of *Āyurvedic medicines.*

Āyurvedic compound formulations are divided into two groups viz. a) *Rasauṣadhi* (predominantly metals and minerals) dealt in *Rasa Śāstra,* b) *Kāṣṭhauṣadhi* (Predominantly plant drugs) dealt in *Bhaiṣajya Kalpanā.* This book *Ocean of Āyurvedic Pharmaceutics* deals with different aspects of *Āyurvedic Pharmaceutical Science.* The book however includes the most commonly accepted formulae for the medicinal preparations.

A step is made through this book to bring the subject of *Rasa Śāstra* and *Bhaiṣajya Kalpanā* in a lucid language and by incorporating all the syllabus of the subject given by *Central Council of Indian Medicine* for B.A.M.S. & M.D. course. I have covered about many important formulae as examples and given the complete details including the practical ways of overcoming the difficulties wherever found out. Though the subject matter on *Rasa Śāstra* and *Bhaiṣajya Kalpanā* is also available in other printed *Āyurvedic books,* it is in a scattered form. Keeping in view of the difficulties faced by students it is tried to bring up this compilation work of *Rasa Śāstra* and *Bhaiṣajya Kalpanā,* by filtering, probing, piercing and extracting the essence of *Āyurvedic standard books.* In this book all the information is collected at one place, codified and arranged in a systematic way, being spelled under suitable relevant headings. Thus this work deals with all the relevant and important aspects of *Rasa Śāstra* and *Bhaiṣajya Kalpanā,* as the parts of the metal, mineral, plant and animal drugs to be used, the appropriate season and place of their collection, weights and measure; substitutes of unavailable drugs, selection of drugs, pharmaceutical processing with their technical aspects etc.

In this treatise of *Rasa Śāstra* and *Bhaiṣajya Kalpanā* all those medicines are brought to these respective sections with wide range information of their pharmaceutical process. Few recipes have also been included which are not mentioned in C.C.I.M. syllabus of *Rasa Śāstra* and *Bhaiṣajya Kalpanā* for the benefit of students. Some of the chapters are discussed in detail, because of there popularity in practical usage. The book is designed according to the sequence of the C.C.I.M. syllabus. Most of the commonly using formulae of *Āyurveda* are described with their details of preparation, the dosage and indications etc. Every attempt has been made to include as many important formulations as are currently manufactured on a large scale in terms of value and in use throughout the country. Though this book is written in English language the technical terms of *Rasa Śāstra* and *Bhaiṣajya Kalpanā* are written in *śānskrit* pronunciation only. It is hoped that, this book will find a wider reading public.

The object of writing this book is that students of BAMS and M.D., *Āyurvedic Physicians,* Pharmaceutical personal and others interested in the preparation of *Āyurvedic medicines* and there method of preparation, may understand better form of this book. The readers may get the equalent modern pharmaceutical terminology of *Āyurvedic technical* terms with their elaborate information, which is necessary for understanding of *Rasa Śāstra* and *Bhaiṣajya Kalpanā* up to some extent.

I am sure this book will be useful at large to the *Āyurvedic students, Āyurvedic Pharmacists, Practitioners* as well as to the drug administration department of the indigenous systems of medicine.

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I fully believe that this endeavor of me, shall help a undergraduate and post graduate students to get acquainted to the pharmacy of *Āyurveda.*

I well come whole heartedly for the positive suggestions and obliged.

It is the effort to pursue a scientific course of *Rasa Śāstra* and *Bhaiṣajya Kalpanā* with mind freed from all superstitions. I would hasten to add here that the reader must not treat this work as an end to subject. A significant beginning is made through this book to think about vast subject. My efforts will be properly rewarded if this work inspires some of our young talents to pursue the subject vigorously and come out with fresh insights and new postulates.

I convey my deep sense of gratitude to respected teacher and dynamic Prof. Panjab Singh, Vice-Chancellor (B.H.U.) for his constant encouragement.

Because the encouragement given by our Dynamic Director Prof. Gajendra Singh, the work could be completed. The lexicons have not given befitting words to express gratitude to him, thus mute reverence is offered.

My sincere thanks are to Prof. Manjari Dwivedi, Dean, Faculty of Ayurveda, I.M.S., B.H.U., it is because for her encouragement, the work could be completed.

Having showed the path of this work, Prof. C.B. Jha, Deptt. of *Rasa Śāstra,* Faculty of Ayurveda I.M.S., B.H.U., has guided in all aspects.

I am also thankful to all my colleagues including Dr. Neeraj Kumar, Dr. A.K. Chaudhary and friends, students of department of *Rasa Śāstra* who inspired to start and complete this work.

Last but not the least, I am highly obliged to Sri Brajendra Kumar, Chaukhambha Sanskrit Bhawan for his encouragement and undertaking the publication of this work.

Prayers are offered to all those sages whose works are the basis of this book, and also at the last feet of almighty for providing courage and wisdom to complete this work

Dr. K. Rama Chandra Reddy

Vasanta Panchami
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मंगलाचरणम्

वक्रतुण्ड महाकाय, सूर्यकोटि समप्रभः ।
निर्विघ्नं कुरु मे देव, सर्वकार्येषु सर्वदा ।।

श्रियं स दद्याद्भवतां पुरारिर्यदङ्गतेजः प्रसरे भवानी ।
विराजते निर्मलचन्द्रिकायां महौषधीव ज्वलिता हिमाद्रौ।।

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Indo-Romanic Equivalents of Devanāgarī Alphabets
(Transliteration of Symbols)

स्वर (Vowels)

अ	a	ऌ	lṛi
आ	a	ए	e
इ	i	ऐ	ai
ई	ī	ओ	o
उ	u	औ	au
ऊ	ū	अं	ṁ
ऋ	ṛ	अः	ḥ

व्यंजन (Consonants)

क्	k	ठ्	ṭh	ब	b
क	ka	ठ	ṭha	ब	ba
ख्	k	ड्	ḍ	भ् भ	bh, bha
ख	kha	ड	ḍa	म् म	m, ma
ग्	g	ढ्	ḍh	य् य	y, ya
ग	ga	ढ	ḍha	र	r
घ्	gh	ण	ṇ	र	ra
घ	gha	ण	ṇa	ल् ल	l, la
ङ्	ṅ	त्	t	व् व	v, va
ङ	ṅa	त	ta	श्	ś
च्	c	थ्	th	श	śa
च	ca	थ	tha	ष्	ṣ
छ्	ch	द्	d	ष	ṣa
छ	cha	द	da	स्	s
ज्	j	ध्	dh	स	sa
ज	ja	ध	dha	ह् ह	h, ha
झ्	jh	न्	n	क्ष्	kṣ
झ	jha	न	na	क्ष	kṣa
ञ्	ñ	प्	p	त्र्	tr
ञ	ña	प	pa	त्र	tra
ट्	ṭ	फ्	ph	ज्ञ्	jñ
ट	ṭa	फ	Pha	ज्ञ	Jña

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Chapter 1

HISTORY OF RASA-ŚĀSTRA AND BHAIṢAJYA KALPANĀ

Āyurveda is the science of life practiced by ancient *Āryans* which is based on *Atharva-Veda*, one of the oldest scriptures of *Hindus*.

According to Indian mythology, *Āyurveda* was first perceived (not composed) by *God Brahmā*, and he taught this science to *Dakṣa- Prajāpati*, who taught it to the *Aśvini- kumāras*, and they taught it to *God Indra*. About the further hierarchy of *Āyurvedic propounders*, different *Āyurvedic* texts considerably vary. According to *Suśruta saṁhitā*, *Lord Dhanvantari* learned it from *Lord Indra* and he taught to *Divodāsa* who is turn taught it to *Suśruta*, *Aupadhenava*, *Aurabhra*, *Pauṣkalāvata*, *Gopurarakṣita* and *Bhoja*. According to *Caraka saṁhitā*, *Bharadvāja* learnt it from *God Indra* and he taught to *Ātreya punarvasu*. The latter in turn taught it to *Agniveśa*, *Bhela*, *Jatūkarna*, *Parāsara*, *Harita*, *Kṣārapāṇi* etc. According to *Kāśyapa saṁhitā*, *God Indra* taught *Āyurveda* to *Kāśyapa*, *Vasiṣtha*, *Ātreya* and *Bhṛgu*. Many different medical works were composed by these sages of the past. However, all of them are grouped under two schools. The *Ātreya* school primarily deals with medicine and the *Dhanvantari* school mainly deals with surgery. Many of these texts are no more extant.

The object of *Āyurveda* is to counteract the imbalance of three very essential elements, *vāta*, *pitta* and *kapha* which constitute the *Tridoṣa* from which the body originates. It is the *Tridoṣa* which regularises the normal working of the human body.

The *Āyurveda* drugs are obtained from natural source only i.e. from plants, animals or from minerals.

Āyurvedic compound formulations are divided into two groups viz.

1. *Rasauṣadhi* (predominantly metals and minerals are used for preparation and dealt in *Rasaśāstra*).

2. *Kāṣṭauṣadhi* (predominantly plant drugs are used for preparation and mainly dealt in *Bhaiṣajya Kalpanā*).

There are several categories of the *Rasauṣadhis* including *Bhasma*, *Piṣṭi*, *Lauha*, *Maṇḍūra*, *Kūpipakva Rasāyana* etc. which are described *Rasaśāstra* and *Kāṣṭauṣadhi* formulations such as *Āsavariṣṭa*, *Avaleha*, *Ghṛta*, *Cūrṇa*, *Taila*, etc., which are described in *Bhaiṣajya Kalpanā*. The system of *Āyurveda* embraces within its fold the drugs of plant, animal and mineral origin, both single drugs and compound formulations. Presently about 1000 single drugs and 8000 compound formulations of recognised merit are in vogue.

HISTORY OF RASA-ŚĀSTRA

Rasa Śāstra as a branch of *Āyurveda* which deals with knowledge of Alchemical and Pharmaceutical processes viz. *aṣṭādaśa saṃskāras* of mercury and *Śodhana*, *Jāraṇa*, *Māraṇa* etc. processes of different Metallic, mineral, calcium substances of aquatic and soil origine and poisnous herbal substances and theraputic parameters of *Rasauṣadhi* viz. Dose, duration, indication and contraindication.

When one trace the origine of application of metal in the mineral in different walks of the ancient society, then one may reach directly to the different stages of progress of human civilization.The survey of *Ṛgeveda* reveals that Copper, Gold, Iron and some other metals and minerals have been used in that period for different purposes including its medicinal uses.

The world famous Indus valley civilization had used several metals and minerals including Gold, Silver, Lead and Stannous etc. for different objective of society.

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Invocation to *soma* goes like; Stimulant that gave the eternity to *devās; medicine to patient; Lord soma removes all the ailments.*

या औषधी पूर्वा जाता देवेभ्यः त्रियुगं पुरा । मनौ नु बभ्रूणामहं शतं धामानी सप्त च । शतं वो अम्ब धामानि सहस्रमुत वीरुधः । अधः शतकृत्वो यूयमिदं में अङ्गदं कृथः ।

औषधं द्रव्यसंयोगं ब्रुवते दीपनाधिकम् । हुतव्रतं ततो दानं शान्तिकर्म च भेषजम् ।

Ṛgveda refers to *Aśvins* substituting the lost leg of *Visphala* by a thigh made of iron. Almost all *Gods* and *Goddesses* described in *Ṛgveda* are personifications of natural phenomena like fire, wind, dawn sun, etc; and, at times, herbs and medicines were considered as *devās; soma* is one of the herbs elevated thus to divinity. It is said that the juice of this herb wins over death hence it is called *amṛta* similar to the *ambrosia* of Greek. The invocation to *soma* the elixir that removed death among *devās,* deserves to be noted. The origin of chemistry can be seen in this adoration of *soma* juice. Similarly, invocations to other medicines can also be seen. There is a whole *sūkta* on herbs. *Atharvaveda* studies herbs and medicines elaborately. *Atharva* containes *tantras*, *mantras* and medicines. *Manusmṛti, Āpastambha, Viṣṇu, Yājñavalkya* etc. decribes these descriptions of *Atharva.* However, it can be seen that *Atharva* had gained popularity among the masses. It classifies medicines into two-bhaiṣajya that cures diseases and *āyuṣya* that provides health and longevity (The distinction between *bhaiṣajya* and *āyuṣya* is seen in *Kāśyapasaṁhita* also). The source of the *rasāyana* part can be traced to the *āyuṣya.* The term *rasāyana* can be considered as the synonym of English term alchemy. The *Sūktās* of *Atharva* appear first in the form of invocation to metals and gems; they promote health and destroy the enemies.

The ideas about alchemy were prevalent in the period of *Atharvaveda.* Ten thousand years ago, only stone implements were in use. After the use of stone, man discovered metal implements. The first metal that came into use was gold; copper, lead and silver followed, iron being the last.

And that was the beginning of civilisation. Various minerals were used for drawings and colourings; but in *Atharva* hymns, they deal with health. As these hymns are the earliest literary documentation regarding internal and external use of metals and minerals as medicines, this can be called the first stage in alchemy. Exhibits from Indus Valley excavations testify to such use in early times; but information regarding their scientific use starts with the *saṁhitās.*

Markaṇḍeya Puraṇa and Viṣṇudharmottara Purāṇa mentioned about *abhrāka dṛti* and *pārada's* therapeutic utility.

Caraka Saṁhitā

सुवर्ण समालः पञ्चलौहाः ससिकताः सुधा, मनःशिलाले। च.सं.

Caraka has classified drugs into three categories viz. (1) vegetable products (2) animal products and (3) metals including minerals. The third category includes gold, iron-rust, copper, iron, tin, silver, lead, *sikatās* (different types of sand), *sudhā* (different calcium compounds), realgar, orpiment, gems and jewels, salts, red ochre and *añjana* (antimony) etc. *Caraka Saṁhitā* mentions about *Sikata, Sudha, Manahṣila, haritāla, maṇi, gairika, lavaṇa* and *añjana* along with different *dhātus* under *Bhouma gaṇa.* These metals/minerals are prescribed for both internal and external use. *Caraka* has also prescribed sulphur and copper pyrite for internal use. Metals and minerals were impregnated with different kinds of decoctions and juice of herbs and dried in sun or shade. Thereafter, these metals were reduced to a fine powder form by grinding in a mortar with pestle and administered to the patient either alone or in combination with several other drugs. It is very interesting that *Śodhan* (*Caraka Śūtra* 5/18) of *pārtiv*

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dravya are mentioned in *caraka saṁhitā,* this may be considered as in-depth knowledge of *caraka* in relation of application of metal and mineral in that period. It has been evident by Another fact that therapeutic application of gems like cats eye, pearl, Ruby, Conch shell etc. The internal administration of different forms of gold, silver, copper etc. has been mentioned in *caraka saṁhitā* in *cikitsa sthāna* (23/252,4/79,7/85,17/125 to 127) and in *siddhi sthana* (3/7). An over all review of material mentioned in *caraka saṁhitā* regarding therapeutic application of metals and minerals invite more attention of researchers in specific relation of their pharmaceutical procedure.

Suśruta Saṁhitā

This *Saṁhitā* represents surgical section. of *Āyurveda* with its full scientific glory. Therefore its writer *Ācārya Suśruta* has been bestowed the title " Father of Surgery" from all contemporary sects of school of surgery. In this *Saṁhitā* also references of therapeutic applications of mineral and metallic substances are found abundantly.

रक्तं श्वेतं चन्दनं पारदं च काकोळ्यापि क्षीरपिष्टिं च वर्गा । सु.सं.चि. २५

Suśruta saṃhitā has described metals and minerals like gold, silver, copper, bell metal, tin, lead, iron and rust of iron for medicinal purposes. *Suśruta* also includes *pārada, ayaṣkānta, phenasma* and *tankaṇa* in various chapters of his *Saṁhitā.* Mercury and sulphur are also described as external medicaments. *Suśruta* describes two *gaṇas* namely *Trapyadi* and *Uṣakādi* under which the drugs namely *trapu, sisa, tāmra, rajata, krisṇaloha, swarṇa, lohamla, uṣaka, saiṇḍhava, śilajīta, kasisadwaya* and *tuttha* are included. *Ācārya Suśruta* had indicated application of Tin, Lead, Gold, Silver, Copper, Iron etc. to treat different kinds of ailments . In Uttar sthan of *Suśruta Saṁhitā* several references of therapeutic application of gems and other substances procured from mines are indicated. As *Suśruta Saṁhitā* is a classic of surgery it has been noticed that several apparataces and instruments used in the surgical processes are made of different kinds of metals or alloys. *Ayaskṛti* (*Suśruta Sūtra Sthāna* 38/63) is the specific contribution of *Suśruta* as it has been described in *Suśruta Saṁhitā* with more clear understandable approach in comparasion of *caraka* (*Suśruta Cikitsa* 10/11). Surprisingly, external application of mercury is also evident in *Suśruta Saṁhitā.* A thorough review of *Suśruta Saṁhitā* provides a sound opinion that, application of metals and minerals are mentioned in this classic from the therapeutic angle as well as other purpose.

These two classical texts are representing condition of *Rāsa Śastra* during that period. In *Āyurvedic* literature material regarding therapeutic uses of substances of metals and minerals are available in a scattered fashion before systematic development of *Rasa Śāstra* which has been represented in the classical literature of same. *Dhātus* were administered in the form of powder (*raja*) only and the concept of processing *bhasmas* was not developed during the classical age. The word *bhasma* mentioned in *Suśruta Saṁhitā* (*Sutra-ll & Kalpa-6*) indicates only the ash of vegetable drugs. But the concept of *puṭa* appears to be developed for the first time by *Suśruta* and the references regarding *tuvaraka rasayāna* reflects about it. The pulp of *tuvaraka* is to be burnt in closed vessels without letting out the smoke (*antardhūma* method), and put into oil (sesamum) and used with rock salt and *srotañjana* as a collyrium (S.Chi.-13/35). The mention of *pākas* namely *Sthalipaka* (S.Chi.-10) etc.

Aṣṭāṅga Saṅgraha and Aṣṭāṅga Hṛdaya

The third century witnessed another significant development in the field of *Āyurveda. Caraka Saṃhitā* and *Suśruta saṃhitā* were not available in their original form. Texts of these classics, which

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were then extant, were in a completely mutilated form. This invited attention of *Vāgbhaṭa* who prepared two works by compiling material from the available works viz. *Aṣṭāṅga hṛdaya* and *Aṣṭāṅga saṅgraha*. In these two works, several metals and minerals are mentioned to be used as remedies.

Suśruta and *Vagbhaṭṭa* explicitly mentioned the word *pārada* and suggested its usage as an external application.

Internal administration of *pārada* was for the first time mentioned in *Aṣṭāṅga Sangrāha's Rasayāna Prākaraṇa* along with *swārṇa- mākṣika, loha, śilājīt* etc. These descriptions clearly indicate that *pārada* was not combined with sulphur but only with *swarṇa- mākṣika*. It can be inferred that during early times powders of metals were used to mix with *pārada* and later on sulphur has replaced other *dhātus*.

The credit of using *viṣa* in therapeutics once again goes to *Vāgbhaṭṭa* (A.H.Utt.Sta.-13) *Aṣṭāṅga Saṅgraha* enumerates *ghatimūṣa* among the list of instruments to be kept in *Bheṣajāgāra*. All these references indicate that the process of *dhātu bhasma* was conceived during the time of *Vāgbhaṭṭa*.

Harṣacarita

Harṣacarita of *Bāṇabhaṭṭa* gives a long list of companions and assistants of king *Harṣa;* this includes physicians, alchemist, mineralogists, priests etc. The list includes 1. *mandāraka* (the son of physician), 2. *Jāṅgulika mayūraka* (toxicologist), *mantrasādhakakarāla* (one who recite mantras), *dhātuvādavidavihaṅgama* (alchemist) and *āsuravivaravyasanivihaṅgaman* (those who able to go to the nadir and earn money- a deep miner). Here mineralogy was an art; it belonged to one of the sixty-four arts; and its aim was to make some worthy minerals out of some worthless ones i.e. through alchemy; the term *Jātarūpaka* for gold makes this clear. Silver is said to have been produced thus. The knowledge in minerology was accomplished through *tantras* and *mantras*.

Arthaśāstra

In *Kouṭilya Arthaśāstra* written by *Cāṇakya*, a great Academic, Economical and Political master of Gupta period, several references of use of metal and minerals for purposes of preparation of utencils, *armory* and some medicinal objective *Śodhana* and *mārdavakara* processes of *dhātus* were mentioned. Even though metals and minerals were used both externally and internally for the preservation as well as promotion of positive health and prevention and cure of diseases, a significant reference to alchemy is made only in the *Arthaśāstra* of *Kauṭilya* during the 4th century B.C. This work described different types of metals, gems and jewels. One variety of gold described there is *Rasa viddha suvarṇa* i.e. gold prepared by transmutation of base metals with the help of mercury. This shows that even prior to his time, this type of gold was available in the market and people knew the techniques of conversion of base metals into noble metals with the help of mercury.

Kubjika-tantra

Manuscripts of this work were traced in Nepal library. It is mentioned that therapeutic action of *pārada* increases due to incineration of it with sulphur for six times. The procedure of transmutation of copper into gold is mentioned in this book. It may be composed in 6th A.D.

References are available about *Ādi Śankāracārya's* preparation of an idol with the *tamra dṛti* processed in a *mūṣa*. All these works clearly indicate that *Dhātuvāda* and *Rasayānacikitsā* picked up momentum by 8th century. *Pārada* was used initially both for *Dhātuvāda* (Transmutation of metals) and *Dehavāda* (Therapeutic implications of *pārada*). Alberuni (11th century AD) clearly indicated the prevalence of *Dhātuvāda* and *Dehavāda* schools during that time. From *Nalanda Viswavidyālaya* (8th cen-

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tury) several *Siddhas* migrated to Nepal, Tibet and Bhutan and started their own centers and some scholars migrated to Devagiri of South and started propagating this science.

Rasendramaṅgala

The first ever work on alchemy is *Rasendramaṅgala* of *Nāgārjuna.* Dr. P.C. Ray ascribes *Rasendramaṅgala* to the seventh or the eighth centuries; but it is obvious that it cannot be earlier than the eleventh century. This book gives more details regarding the use of mercury than what we get from the work of 8th century i.e. *Cakradatta* or *Vṛnda.* Of the eight chapters of this work, only four have been traced in a mutilated form. It discusses eighteen refining processes of mercury; alchemic combinations are also explained.

Cakrapāṇi (11th century A.D.), the eminent commentator of *Caraka saṁhitā* and *Suśruta saṁhitā,* in his work, also included metallic and mineral preparations for the treatment of diseases. References show that the mercury, sulphur, etc. used for treatment from *Dṛḍhabala* to *Cakradatta* and *Vṛnda* were minimal; though minerals and gems were used, it was used in a powdered form. Gradually, by the increase in the use of mercury and sulphur, they came to be used in the powdered form. Though mercury and sulphur were known to us as early as *Pāṇini's* time. *Vṛnda Mādhava* (10th century A.D.) supplemented the classical methods of treatment of diseases with metallic and mineral preparations and described the outline of their processing as well as preparation of *bhasma. Cakrapaṇidutta* mentioned about *Nāgarjuna's Lohaśāstra* which was followed at a later stage by *Vaṅgasena* and *Āḍhamalla.*

Kakṣapuṭa and Rasahṛdaya

Kakṣapuṭa explains some remarkable mineral and *tantric* devices to stop fire (*agnistaṁbhana*), to stop water *(jalastaṁbhana)*, to stop army *(Senāstaṁbhana)*, etc. and feats like enticement *(Vaśikaraṇa),* disappearance of man *(Manuṣyāntardhānam),* magic *(Citrakaraṇa*) demonology *(Bhūtanāśanam)* and many supernatural things. *Govindācārya,* the famous *siddha* after *Nāgārjuna,* is the author of *Rasahṛdayatantra.* According to him the immortal body is the basis of all knowledge; it is the means for *dharma, artha, kāma* and *mokṣa;* one can attain the position of *rasasiddha* only with the help of the body. He says that those who want to consume mercury without oxidizing it in mica or gold are like those who want to reap without sowing. Only time-consuming and strenuous process of penance will bring the benefit of alchemic treatment. First, the mind and body have to be purified; then the body does not have to strain much to conquer ageing and death. The author calls on us to adopt this method; its advantage is that only minimal dosage is required and the feature is superior to herbs. *Govindācārya* is as famous as the preceptor of *Śaṅkarācārya;* but none of his works are available on *Advaita. Mādhavācārya* in *Sarvadarśanasaṅgraha* has quoted some parts from *Rasahṛdayatantra. Govindācārya* appears in the account of alchemist *siddhās* in *Rasaratnasamuccaya.* So, *Rasahṛdayatantra* might have been composed before the thirteenth century; the text is well-organised and complete. Introducing himself, the author says that *Madana*, the king belongs to *candravaṁśa* (the lunar dynasty), had presented several awards to him; this king was an expert in alchemy. This work describes eighteen ways of processing mercury and its various uses in detail. This is the first systematic treatise on alchemy. Later, mercury came to be used mixed with mica, gold and precious stones for specific diseases; this form prevails in *Rasaśāstra* today.

Gorakṣa-saṁhita

Gorakṣanātha belonging to 12th AD has written this work which is named as *Saṁhita.* The author indicated that the subject was described in one lakh *ślokas.* It consists of two parts namely *kadi prakaraṇa*

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and *bhūti prakaraṇa*. Under *kadi prakaraṇa, mantra, tantra* and *yantras* were described and in *bhūti prakaraṇa rasa* and *rasāyana* were delineated.

Rasendracūḍāmaṇi

The author of this work is *Somadeva* (12th or 13th c). This work gives more details about the equipments of the alchemist. The details given in *Rasaratnasamuccaya* are based on this. *Rasendracūḍānaṇi* describes *Koṣṭika yantra* and *Ūrdhvapātana yantra* in the words of *Nandi;* perhapse, the works of *Nandi* might have been available in that period. *Rasaratnasamuccaya* also gives details of *Nandi*.

Rasārṇava

This is in the form of discussion between *God Śiva* and *God Pārvati;* the chapters of this are called *paṭalās. Mādhava* describes this work in *Sarvadarśanasaṅgraha. Rasārṇava* belongs to the twelth century; this contains a list of items necessary for practising alchemy and describes the colour of the flame of each mineral (even today a mineral is identified by the colour of its flame). It is evident that chemistry had made much progress by this time; the process for refining minerals had been developed. It was on this basis that mica and other minerals were refined.

Rasapaddhati

Bindu has written this work during 13th AD and some historians opine that he belongs to 15th AD. The total text was written in one *candas* of *Śārdula-vikridita. Yādavji* has edited and published it during 1925 from Nirnayasāgar Press, Bombay.

Ānanda kanda

Ānanda kanda is one such important text written in 13th century. That gives an elaborate description of this subject. This text is supposed to be written by *Manthāna Bhairava,* a *Rāja Vaidya* of the Island of *Simhala (Parada Vignaniya* page No. 319). This text was published in 1952 based on the three main sources; one is from manuscript obtained from Tanzore library, second from Mysore *Raṣṭrīya Pracchya Grantha Samgrahalaya* in telugu language and the third from that which was published in 'Akhila Bharatiya Vaidya Sammelana Patrika'. It was also published by veturi sankara Sastri, Editor, Sri Dhanvantari Patrika in Telgu language from Muktyala, Andhra Pradesh in 1969 based on the compiled articles published in *Sri Dhanvantari Patrika* serially from 26th volume 6th issue may 1963 to volume 32 to 10th issue sept. 1969. The subject matter of *Ānanda kanda,* it is described in the form of *Śiva Pārvati Sambhāṣa* (Conversation of Lord *Śiva* and Goddess *Pāravati*). This text was written in two parts titled as *Viśranti.* Each *Viśranti* comprises of chapters called *Ullāsa.* The first *Viśranti* is known as *Amritīkiaraṇa Viśranti* and comprises of twenty six *Ullasa.* The second *Viśrānti* is known as *Kriyakarana Viśranti* comprising of ten *Ullāsa.* The author of the text i.e. *Manthāna Bhairava* was supposed to be the chief Royal physician at the court of king of *Simha dweepa* (Srilanka). This reflects that the knowledge of the science of *Rasa Śāstra* in ancient days flourished not only in India but also up to countries like Srilanka. The author devoted total 12th *Ullasa* of 1st *Visranti* especially to describe about *Srisailam* an area in Nallamala forest in Andhra Pradesh, a famous pilgrimage centre of *Lord Śiva* (*Mallikārjuna*) along with the neighbouring places. This place is also claimed to be the place where the famous *Rasa Siddha Nāgarjuna* had moved about extensively (during his attempts to attain *Rasa Siddhi).* This reflects that the author belonged to/was well acquainted with Andhra Pradesh. This factor is also vivid through the numerous Telugu terms that we come across in the text.

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Rasaratna Samuchchaya

Rasaratna Samuchchaya as mentioned above, is a work of *Rasaśastra*, written probably between 1300 AD and 1400 AD. This work is said to be a compilation, not an original work, as the author himself agreed at the begining of the text. He has quoted several earlier scholars from whose works he has borrowed liberally.

रसांकुशो भैरवश्च नन्दी स्वच्छंद भैरवः ।।
मंथान भैरवश्चैव काकश्चण्डीश्वरस्तथा । वासुदेव ऋष्यशृङ्गः क्रिया तन्त्रसमुच्चयी ।।
रसेंद्रतिलको योगी भालुकी मैथिलाह्ययः । महादेवो नरेन्द्रश्च रत्नाकर हरीश्वरौ ।।
ऐतेषां क्रियतेऽन्येषां तंत्राण्यालोक्यसंग्रहः । रसानामथ सिद्धानां चिकित्सार्थोपयोगिनाम् ।।
सूनुना सिंहगुप्तस्य रसरत्नसमुच्चयः । रसोपरस लोहनी यंत्रादिकरणानि च ।।
शुध्द्यर्थमपि लोहानां तन्त्रादिकरणानि च । शुद्धिः सत्वं दृतिर्भस्मकरणं च प्रवक्ष्यते ।।

र.र.स. १/५-१०

Vāgbhaṭṭacārya the son of *Simhagupta*, composed the book, *Rasa Ratna Sāmuchchaya*, which is useful in the treatment and which consists of *Siddha Rasa* (experimented mercurial formulations) by refering all the *Rasagranthas* (books on mercurial operations) which are authored by *Rasendratilaka*, *Yogi*, *Bhaluki*, *Maithila*, *Mahādeva*, *Narendra*, *Ratnakara*, *Harīśwara* etc., and editors (compilers) like *Rasānkuṣa*, *Bhairava*, *Nandī*, *Swachhanda Bhairava*, *Manthāna Bhairava*, *Kākacaṇḍīśwara*, *Vāsudeva*, *Ṛṣyaśṛṅga* who have compiled many works relating to mercurial operations

This scripture on *Rasaśāstra* is praised to be one of the best treatise written in this field. The distinct description such as of *Rasa*, *Uparasa*, *Loha* and *Yantra* and *puṭa* which are used in *Śodhana*, *Māraṇa* of them, is given in this text. It also contains the detailed account regarding *Dhātu*, *Upadhātu* and their *Śodhana*, *Māraṇa*, *Satvāpātana*, *Dhṛtikaraṇa* etc. Compared to earlier works, it is more systematic in arrangement of subject matter as well as description. It is praised in no uncertain words by a well known scholar Sir P.C. Ray, in his 'History of Hindu Chemistry' an authoritative work on ancient Indian Chemistry. He writes ''*Rasaratna Samuchchaya* is a systematic and comprehensive treatise on materia medica, pharmacy and medicine. Its methodical and scientific arrangement of the subject matter would do credit to any modern work and altogether it should be pronounced a production of unique of its kind in *Śanskṛt* literature.''

Resendracintāmaṇi

During 16th AD *Dhuṇḍhukanātha* of *Śaiva sāmpradāya* composed this book. Dr. Roy considers the period of this work as 13th-14th AD. A mention was made about *rasārṇava.*, *nityanātha*, *siddha Lakshmidhar*, *Trivikrama Bhatt* and *Cakrapāṇi* in this work. The author remarked that he has included his own experiences in the treatment of *jwarādi rogas* and discussed the contents in total 9 chapters.

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Rasaprakāśasudhākara

Written by *Yaśodhara* of Junagadh in the thirteenth century; *Rasaratnasamuccaya* has borrowed much from this work. This is the best systematically arranged work among all the works prior to *Rasaratnasamuccaya.* The processing of calomel and the means of identifying gold, *mahārasa, uparasa,* various mineral, precious stones, etc. are described in this work in a great deal.

Rasaratnākara

The author is *Nityanāthasiṁha,* son of *Pārvati.* It has five parts *(khaṇḍās)* i.e. *rasakhaṇḍa, rasendrakhaṇḍa, vādikhaṇḍa, rasāyanakhaṇḍa* and *mantrakhaṇḍa;* the subject matter of all except *vādikhaṇḍa* and *mantrakhaṇḍa* are *Āyurvedic. Rasaratnākara* precedes *Rasaratnasamuccaya* since the latter refers to *Nityanātha.* As there are some *Unāni* terms in this work, it appears that *Unāni* system prevailed at that time, this reveals that the period of the author might be after the thirteenth century. This work contains many formulations; this indicates that alchemy must have been well established by that time. Many works like *Dhāturatnamāla, Suvarṇatantra, Kākacaṇḍīśvaratantra, Rasacintāmaṇi,* etc. had been brought out by them; this was the golden age of alchemy. The iron pillar near Kutab Minar in Delhi was built about this time. The references in various works to *lohadruti* (procedure of preserving gold, silver, etc. in liquid form) and the power of mercury to absorb gold indicate that the development of alchemy had reached its peak by that time. The *tantric* knowledge, hand in hand with the alchemic knowledge, set man on his quest for minerals like mercury, sulphur, and their processing, which led to a wealth of scientific knowledge.

Rasasāra

This work is of *Govindācārya;* the author says that the system of alchemy was known to the Buddhists of Bhoṭa region and that he was composing the work because of his knowledge of Buddhist literature. From this, it is clear that alchemy was popular among the Buddhists of Tibet in the twelfth and thirteenth centuries. This work describes the use of opium, but does not mention its source and says that it originates from some poisonous sea-fish.

Govindācārya has written this work during 14th AD. He belongs to *Kāpalika paramparā. Pārada aṣṭādaśa saṁskāras* were discussed in detail.

Āyurveda prakāśa

Mādhava the author of this work is different from the author of *Mādhavanidhāna.* According to the author, those who can demonstrate the use of mercury before the disciple alone are eligible to be preceptors; the rest are frauds. This shows that *rasavidya* was difficult to learn. No work other than this deals with the process of making gold in foils. Therefore, the composition of this can be attributed to the 14th century.

Dhāturatna mālā

Devadatta composed *Dhāturatna mālā* during 14th AD.

Sarva darśana saṅgraha

The philosophical background of *Jīvan mukti* (salvation while the individual is alive) was explained by *Mādhavācārya* during 14th century in his *Sarva darśana saṅgraha.* A separate section of this work called *Raseśvara darśana* deals with this topic.

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Rsendra Sāra Saṅgraha

Rasendra Sāra Saṅgraha according to historians is a work of 14th Century AD. *Gopalakṛṣṇa Bhaṭṭ* is the author of this work, who is said to be the contemporary of *Śāraṅgadhara* of *Śāraṅgadhara Saṁhitā* and *Duṇḍukanātha,* the author of *Rasendra Cuḍāmaṇī.* Lot of material has been borrowed by *Gopalakṛṣṇa Bhaṭṭa,* from the earlier texts, in preparing *Rasendra Sāra Saṅgraha*, which is sincerely admitted by the author. The test can be distinctly halved into two sections. First one deals with the minerals and metals with properties, *śodhana, māraṇa* etc. The second part includes the *Rasa yogas* or formulations in various diseases. Though *pārada* has been given the due status, more practical approach of its *śodhana* and *māraṇa* has been comprehensively discussed. However a very brief account of *Aṣṭa Saṅskāra* of *Pārada* has been given. The minerals like *gairika, capala* and *mṛddāraśṛṅga* have not been described. Also the description of gemstones and their therapeutic account is brief. However *kāntapāṣāṇa,* which is not mentioned by other texts, finds place in this work. Even the reference of *trividha pāka* of *loha* is unique. As said earlier the second part of the text deals mainly with formulations useful in various diseases. There are about 600 such *rasayogas* mentioned with the ingredients and their therapeutic action. Thus this makes it more a useful treatise for *vaidyas* who could choose from a plethora of formulations. It can be safely opined that *Rasendra Sāra Saṅgraha* can be claimed to be a comprehensive treatise of *Rasaśāstra,* after *Rasaratna Samuccaya.*

Rasarājalakṣmi

Viṣṇudev, the court physician of king *Bukka* has written it during 14th century. Bukka's period is fixed during 1354-1371 AD. The author has quoted the works of *Nāgārjuna, Dāmodara, Vāsudeva* and *Govinda Bhāgavatpada* and texts namely *Rasārṇava* and *Kakacandiśwara.*

Lohasarvaśwa

Ācārya Sureśwara has compiled this work during 15th century and it was quoted by *rasakāmadhenu* (17th AD) and *Āyurvedaprakāśa* (18th AD). In this work 4 varieties of *loha* were mentioned instead of 8 varieties usually mentioned in other *Rasaśāstra* texts.

Rasacintāmaṇi

Anantadeva Suri has written this work during 15th AD. The subject content was described in 11 *stambakas* (chapters). Twenty different procedures to proces *rasabhasma* were mentioned in this work. Many *rasayogas* were mentioned and eleven procedures related to alchemy were also described in this book.

Rasa ratna pradīpa

Rāmarāja, the son of *Ratna pāla* composed *Rasa ratna pradīpa* during 15th A.D.

Rasakāmadhenu

Sri Cuḍāmaṇi Miśra has written this work during 16th AD. It is divided into four parts namely *upakaraṇa pāda, dhātusaṅgraha pada, rasakarma pada* and *cikitsa pāda.*The author compiled all the fundamental views of his predecessors' works namely *Gorakṣa saṁhita, Purandara rahasya, Kakṣaputa, Śaivālabhāṣya, Rasendramaṅgala* etc. *Ācārya Yādavji* has published it during 1925 form Bombay.

Rasapradīpa

Prānanātha has written this book during 16th century AD. It contains the descriptions about *phirangi roga* and it's management with *chopchini* and basing on these reference it can be considered that this

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work belongs to post *Bhāvamiśra's* period. The descriptions of *Śānkhadrāvaka* are also available in this work.

Rasakaumudi

Jñanacandra Śarma has written this work during 16th AD. The contents were discussed in four *Adhikaras* (chapters), which include *pārada-saṁskāras, Śodhana* and *māraṇa* of *abhraka, vaikrānta, makṣika* etc. and specific formulations.

Ṭoḍarānanda

Ṭoḍaramalla, the Minister of the Moghul King Akbar, composed his encyclopaedic work *Āyurveda Saukhya* in the *Ṭoḍarānanda* Series. This compilation work deals with basic principles, materia medica and diagnosis as well as treatment of diseases. Several chapters of this work are devoted to *Rasa śāstra,* and for the treatment of diseases several mercurial and metallic preparations are prescribed.

Rasa saṅketa kalikā

Kāyastha Cāmuṇḍa's, Rasa saṅketa kalikā were also composed in the 16th century A.D.

Rasa pradīpa

It is composed by *Prāṇanāda* during 16th A.D. *Rasa pradīpa* describes the preparation of *Rasa karpūra* for the treatment of syphilis and several pain-killers were described by adding opium and nuxvomica to mercury and sulphur.

Ḥbāva prakāśa

Bhāva Miśra in his *Ḥbāva prakāśa* included several metallic preparations for the treatment of diseases and it is also composed in 16th A.D.

Dhātu kriyā or Dhātu mañjarī

In the 17th century A.D., *Dhātu kriyā* or *Dhātu mañjarī* was composed in the form of a dialogue between God *Śiva* and *Godess Pārvatī* on the lines of *Rasārṇava tantra*. The author of this work had preferred to remain anonymous.

Bṛhadyogataraṅgini and Yogataraṅgini

Trimālla Bhaṭṭ has compiled these two works during 17th AD. In *Bṛhadyogataraṅgiṇi* all the eight *aṅgas* of *Āyurveda* were discussed under 148 *taraṅgas* (chapters) and in *yogataraṅgini Āyurvedic yogas* were quoted in larger umber in total 80 *taraṅgas. Āyurvedic* physicians considered this work as the treasure of *Āyurvedic* formulations.

Yogaratnākara

Bhikṣu Mayūra Pāda composed *Yoga ratnākara* during 18th century. In this work diagnosis and treatment of diseases are described. For the treatment, many metallic and mercurial compounds along with tobacco and *copcīnī* (*Smilex china* Linn.) are prescribed.

In this work the colour of different processed *bhasmas* was mentioned viz.

Suvarṇa bhasma	:	*Campaka varṇa*
Rajata & tāmra bhasma	:	*Kṛṣṇa varṇa*
Tikṣṇa loha bhasma	:	*Jambu phala varṇa*
Abhraka bhasma	:	*Iṣṭika varṇa*

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Ācārya Prakāś Candra Satapati considers that the author of this work belongs to *Andhra* region as he has used certain *Telugu* vernaculars. Eg. *paṭika* (for *sphaṭika*), *taṅkaṇa* etc.

In this work good number of *Rasayogas* were compiled.

Bāsavarājīyam

Nīlakaṇṭa Bāsavarāju of *Vīraśaiva sāmpradāya* belonging to Andhra region has written this book during 18th AD. He has popularized the usage of *rasakarpūra* in the treatment of *vātavyādhis* and quoted various varieties of *pāṣana*. The contents were written in two languages i.e. *Sanskrit ślokas* and *Telugu* poems and he has followed totally the work namely *Vaidyacintāmaṇi* of *Vallabhācārya*.

Bhaiṣajyaratnāvali

Govindadās Sen has compiled this work during 18th century. It consists of larger number of *Rasayogas* compiled from various sources and this work has become a very popular therapeutic guide for the *Āyurvedic* practitioners.

Bṛhat rasarāja sundara

Bṛhat rasarāja sundara of Dattarāma Caube (19th century).

Rasataraṅgiṇi

Sadānanda Śarma has written this book during 20th century. This book provides extensive description of the use of mercurial and preparations for the treatment of different disease conditions. In this work new formulations namely *mugdharasa, Śorakadrāvaka, lavaṇadrāva, gandhakadrāva* etc. are mentioned. All *Rasaśāstra* drugs are described in terms of synonyms, types, *guṇa, śodhana, marana* and *amāyika prayogas*. The author has also written a commentary on *Rasakaumudi* and also edited *Pāradayoga Śaśtra*. This has become very popular book on *Rasaśāstra*.

Rasāmṛtam

It is writen by *Ācārya Yādavji* during 1951 in 9 chapters. In *Rasa-Śāstra, Pārada* (mercury) is main drug hence it has been described in first chapter named *'Rasa vijnānīyam'*. After *pārada, gandhaka* is the most important hence, it has been described in second chapter named *'Gandhaka vijñānīyam'*, After this the third chapter in named as *Lohavijnāniyam* beccause in this, gold, silver, copper, tin, lead, zinc and iron etc. seven metals are described. In addition to these metals some alloys and a few important minerals of copper, lead & Iron etc. are also described in this chapter. In copper alloy *pittala* and in copper containing minerals *mākṣika, tuttha* and *jangāra* have been described. In lead containing minerals *sindūra, mṛiddāra-śṛiṅga, saphedā* and *sauvīrāñjana (Nīlāñjana)* are described. In zinc containing minerals *puṣpāñjan* and *kharpara/Rasaka* are described, and in iron containing minerals *maṇḍūra, vimala, kāsīsa, gairika, abhraka, ayaskānta, śilājatu* are described. These minerals either contain particular metal or these are prepared with that metal from these respective metals may be extracted as *Satva* hence these are described along with respective metals in Loha *vijnānīya* chapter. The fourth chapter is known as *''Malla vijnānīyam''*. In this chapter *malla* (arsenic) and arsenic containing minerals like *haritāla* and *manaḥ-śilā* are described.

The fifth chapter is known as *''Sudhā vijnānīyam''*. In this chapter *sudhā* (Calcium) and calcium containing minerals like *khaṭikā, godantī* and *sapheda surmā* are described as these are calcium compounds. The sixth chapter is known as *''Sikatā vijnānīyam''*. In this *sikatā* (silica) and *silikā* containing minerals like *dugdha pāṣāṇa, kauśeyāśma, jaharamoharā* and *hazurul yahuda* are described. The sev-

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enth chapter is known as *''lavaṇa kṣāra vijnānīyam''*. In this *lavaṇas* and *kṣāras* popularly known and used amongst vaidyas are described. The eight chapter is known as *''Ratna vijnānīyam''*. In this *Ratnas* and *Uparatnas* used in *Rasaśāstra* and also the similar drugs used in unani medicine like sange *yaśava, akīka* and *kaharuvā* are described which may be considered as *Uparatnas*. The nineth chapter is known as *Rasa yoga vijnānīyam''*. In this chapter sixty six *Rasa*, preparations which are most important and popular amongst *Āyurvedic* physicians are described.

Rasajalanidhi

Pandit Bhudev Mukherji of Calcutta has written this book in five volumes with English translation during 1923-1938. He has compiled most of the view of his predecessors.

History of Hindu Chemistry

Sir P.C. Ray of Calcutta has written this work in English during 1904 and consists of two volumes with all relevant references. He has edited the works namely *Rasārṇava, Rasendramaṅgala* etc. This is considered to be most authoritative book on the historical aspects of *Rasaśāstra.*

Pārada Vignāniyam

During 1969 *Sri Vasudevbhai Mulshankarji Dwivedi* has compiled this work. Eight *Samskāras* of *Pārada* were mentioned with all practical implications and recording of the temperature at various stages of *kūpipakwa* was reported for the first time in this work.

Cikitsā kalikā

During this century *Tisaṭācārya* wrote *Cikitsā kalikā* where some metallic preparations in *bhasma* form were described for the treatment of diseases.

Rasayogasāgar

Pandit Hariprapanna Śarma of Bihar has written this book during 1927. The introduction written by the author is more significant from *Rasaśāstra's* historical point of view. It is considered to be the huge collection of *Rasayogas* arranged alphabetically.

Bharatiya Rasaśāstra

Vidya Vāmana Ganesh Desai has written it in Marathi language during 1935. The foreword was written by *Sri Dattatreya Ananta Kulakarni* and was published by *Ācārya Yadavji.* This is claimed to be the most popular work of *Rasaśāstra.*

Different Books related to Rasaśāstra with their Author Name are Mentioned below :

Name of the Book	Author
1. *Agastyā Saṁhita*	Agastyā
2. *Ajirṇamañjari*	
3. *Abhidhāna Kāmdhenu*	
4. *Alchemy and Mettallic Medicines in Āyurveda*	Vaidya Bhagwandash
5. *Abhinav Rasa Śāstra*	Somdev Sharma
6. *Ānandkand*	Manthan Bhirav
7. *Āyurved Prakaśa*	Madhava
8. *Āyurveďīya Khanij Vijnan*	Kaviraj Pratap Singh

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9. *Āyurvedīya Rasa Śāstra*	Madhava
10. *Āyurvedīya Rasa Śāstra*	Dr. Chandra Bhushan Jha
11. *Āyurvedīya Rasa Śāstra*	Dr. Siddhinandan Misra
12. *Āyurvedīya Rasa Śāstra*	Dr. K. Nishteswar & R. Vaidyanath
13. A Text Book of *Rasaśāstra*	Dr. Vilas Dole, Dr. Prakash Paranjpe
14. *Ayurvedīya Rasāyana*	Bhojaraj
15. *Āsav-Ariṣṭa*	Satyadev Vidhyalankar
16. *Āsavriṣṭa Samgraha*	Pakṣadhar Jha
17. *Kakṣapuṭ*	Acharya Nagarjun
18. *Kankālī*	Nasir Shah
19. *Kalyāṇ Kark*	Ugradityacharya
20. *Kākacaṇḍīśwar Tantra*	Acharya Shri Nagarjun
21. *Kamdhenu Tantra*	
22. *Kūpipakwaras Nirmaṇ Vijnān*	Harisarana Nand
23. *Kautuka Cintāmaṇī*	Pratap
24. *Kṣīrsindhu*	
25. *Gandhak Kalpa*	
26. *Gorakṣa Saṁhitā*	Acharya Gorakhnath
27. *Gaurikāñchlika Tantra*	Bhairav
28. *Charpaṭ Siddhanta (Vijnān)*	Charpati
29. *Toḍarānand*	Todarmal
30. *Tantraraj*	Jabaal
31. *Tantrasār Koś*	Sankunath Datta
32. *Tāmravan*	Mundi
33. *Dattatreya Tantra*	Dattatreya
34. *Dattatreya Saṁhitā*	
35. *Divyarasendra Sara*	Dattareya
36. *Divyarasendra Sar*	Dhanpati
37. *Deviyāmal*	
38. *Dhanwantri Saṁhitā*	
39. *Dharaṇīdhar Saṁhitā*	Dharnidhar
40. *Dhātupaddhati*	
41. *Dhātumañjari (Dhātukriya)*	Rudryamal Tantriya
42. *Dhāturatnamala*	Devdatta
43. *Dhāturasāyana*	
44. *Dhātuvād*	Tibbati Grantha
45. *Navratna Dhātu Vivād*	Balbhadra
46. *Nāgarjuniya Indrajāl*	Acharya Nagarjun
47. *Nāsaṭya Saṁhitā*	

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48. *Nūtankalp*	Vaidya Hariprapana Sharma
49. *Pāka Vijnān*	
50. *Pākāvali*	
51. *Pārada Yogaśāstra*	Shivrama Yogindra
52. *Pārada Vijnānīya*	Vasudeva Bhai M. Dve
53. *Pārada Sāṁhitā*	Niranjan Prasad Gupta
54. *Pārada Sāṁhitā*	Chittodbhav Swami Hansraj
55. *Pūrandar Rahasya*	Jyasthmal Vyas
56. *Pratyakṣa Auṣadhi Nirmāṇ*	Acharya Shri Pandit Vishwanath Diwedi
57. *Prayog Cintāmaṇī*	Rammanikya Sen
58. *Prāchin Bharat me Rasāyan ka vikas*	Dr. Satyaprakash
59. *Prārambhik Rasa Śāstra*	Siddhinandan Mishra
60. *Bandhsarvaswa*	Gorakhnath
61. *Bāhaṭ*	Gauriputra Kartikeya
62. *Bauddha Sarvaswa*	
63. *Bhasma Parpaṭī*	Devisaran Garg
64. *Bhasma Vijnān*	Harisarananand
65. *Bhārat Bhaiṣajya Ratnākar*	Gopinath Gupta (Unjha)
66. *Bhāratiya Raspaddhati*	Atridev Gupta
67. *Bhāratiya Rasa Śāstra*	Vaman Ganesh Desai (Marathi)
68. *Bhārtiya Rasa Śāstra*	Acharya Shri Pandit Vishwanath Dewivedi
69. *Bhārtiya Rasa Śāstra*	Bapalal G. Shah (Gujrati)
70. *Bhārtiya Rasāyan Śāstra*	Vishweshwar Dayalu
71. *Bheṣaja Kālpana Vijnān*	Awadhvihari Agnihotri
72. *Bheṣaja Saṁhitā*	Gujrat Govt. Pharmacopia
73. *Bheṣaja Saṁhitā*	Atridev Gupta
74. *Bhaiṣajyaratnāvali*	Gobind Dash Sen
75. *Bhaiṣajyasāramṛt*	Upendra
76. *Makardwaja Candrodaya*	Radhavallabha Vaidya
77. *Makardwaj Rahasya*	
78. *Makardwaj Siddhayog*	Sambhunath
79. *Manthān Bhairava Tantra*	Manthan Bhairav
80. *Maharsānkuś*	Rasankush
81. *Maharasāyan Tantra*	Rasankush
82. *Mahodadhi*	Shivnath Yogi
83. *Yoga Candrikā*	Lakshman
84. *Yoga Cintāmaṇī*	

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85. *Yogtarangaṇi*	Trimalla Bhatta
86. *Yogtarangaṇi (Bṛhada)*	Trimalla Bhatta
87. *Yogmāla*	Yogsiddh
88. *Yogratnamāla*	Nagarjun
89. *Yogratnakar*	
90. *Yogsamucchaya*	Vyasputra Ganapati
91. *Yogsara*	
92. *Yogsudhānidhi*	Bandhi Mishra
93. *Yogāmṛta*	Gopaldash
94. *Ratna Parikṣa*	K.S. Subhramanyam Shastri
95. *Ratna Parikṣa*	Agarchanda Nahata
96. *Ratna Vijnān*	Purushottam Dash Swami
97. *Ratna Vijnān*	Radhakrishna Parasar
98. *Ratna Auṣadhi Yoga*	
99. *Raskankali*	Kankal Yogi
100. *Raskalpataru*	
101. *Raskalpalata*	Narayan Mishra
102. *Raskalpalata*	Manganiram
103. *Raskalpalata*	Kashinath (Kanchinath)
104. *Raskaṣāya Vaidhyak*	Vaidhyaraj
105. *Rasa Kamdhenu*	Churamani Mishra
106. *Rasa Kinnar*	
107. *Rasakautuka*	Mallari
108. *Rasakaumudi*	Gyanchandra Sharma
109. *Rasakaumudi*	Madhava
110. *Rasakaumudi*	Golhadeva
111. *Raskaumudi*	Shaktivallabha
112. *Rasajnānam*	Gyanjyoti
113. *Rasagovinda*	Govinda
114. *Rasacakra*	Brihaspati
115. *Rasacaṇḍānśu*	Shankar
116. *Rasacaṇḍānśu (Marathi)*	Dattavallal Borkar
117. *Rasacandrika*	Nilambar Purohit
118. *Rasacandrika*	Madhava
119. *Rasacandrodaya*	Chandrasen
120. *Rasa Cikitsa*	Prabhakar Chattopadhaya
121. *Rasa Cikitsa Vimarś*	Somdeva Sharma
122. *Rasa Cintāmaṇi*	Magdeva Suri
123. *Rasa Cintāmaṇi*	Anantadeva Suri

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124. *Rasajalanidhi*	Bhudev Mukharjee
125. *Rasatatvavisechan*	Krishnagopal Dharmartha Trust, Kaleda Bogada-Ajmer
126. *Rasatantra*	Guha
127. *Rasatantra*	Virbhadra
128. *Rasatarangamalika*	Janardhan Bhatt
129. *Rasatarangaṇi*	Sadanand Sharma
130. *Rasatarangaṇi*	Vidhyadhar Vidhyalankar
131. *Rasadharpaṇa*	Trimal Bhatta
132. *Rasadharpaṇa*	
133. *Rasadhipika*	Anandanubhav
134. *Rasanighaṇṭu*	
135. *Rasanibhandha*	
136. *Rasnirmaṇa Vidhi*	Acharya Aswaghosh
137. *Rasapaddhati*	Acharya Shri Bindu
138. *Rasaparamchandrika*	
139. *Rasapārijāt*	Laxmidhar Sarswati
140. *Rasapārijāt*	Vaidhyasiromani
141. *Rasaprakāśa*	
142. *Rasaprakaśasudhākar*	Yasodhar Bhatta
143. *Rasaprakāśika*	Ramkrishna Sharma
144. *Rasapradīp*	Ramchandra
145. *Rasapradīp*	Nagdeva
146. *Rasapradīp*	Nagnath
147. *Rasapradīp*	Prannath
148. *Rasapradīp*	Ravidatta
149. *Rasapradīp (Bṛhad)*	Sankar Bhatta
150. *Rasapradīpika*	Shri Prananathsiddha
151. *Rasapradīpika*	Mangalgirisuri
152. *Rasaprabhandha*	
153. *Rasaprabhandha Candrodya*	Vishaldeva
154. *Rasaprayoga*	
155. *Rasabodhchandrodaya*	
156. *Rasabhasmo Ki Sevan Viddhi*	Vaniprashad Vaidhya
157. *Rasa Bhairava*	Bhairav
158. *Rasa Bhaiṣajyakalpadipika*	Suryapandit
159. *Rasa Bhaiṣaja Ratnāvali*	Suryakavi
160. *Rasamangal*	
161. *Rasamañjari*	Shalinathsiddha

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162. *Rasamartaṇḍya*	
163. *Rasamanas*	Dayaram
164. *Rasamaṇi*	Har
165. *Rasamitra*	
166. *Rasamitra*	
167. *Rasamuktāvali*	Trayambaknath Sharma
168. *Rasayāmal*	
169. *Rasayoga Muktāvali*	
171. *Rasayogaśatak*	Pradhyumnacharrya
171. *Rasayogasāgar*	Vaidhya Hariprapanna Sharma
172. *Rasarañjan*	
173. *Rasaratna*	Shrinath
174. *Rasaratna Kaumudi*	
175. *Rasaratnadīpika*	
176. *Rasaratnapradīp*	Jangbhadur
177. *Rasaratnapradīp*	Ramraj
178. *Rasaratnapradīp*	
179. *Rasaratnamaṇimāla*	Bababhai Vaidya
180. *Rasaratnamāla*	Nityanathsiddha (Parvatiputra)
181. *Rasaratnākar*	Nagarjun
182. *Rasaratnākar*	Devacharya
183. *Rasaratnākar*	Charapani
184. *Rasaratnākar*	Nityanathsiddha (Parvatiputra)
185. *Rasaratnāvali*	Chandraraj Kavi
186. *Rasaratnāvali*	Gurudatta Siddha
187. *Rasarasāyanguṭikāguggulu*	Devisaran Garg
188. *Rasarahasya*	
189. *Rasaraj*	Lakshmaswar
190. *Rasarājpaddhati*	Rajalakshmansingh Vaidhya
191. *Rasarajamahodadhi*	Kapali
192. *Rasarajamahodadhi*	Bhagat Bhagwandash
193. *Rasarajamārtaṇḍa*	Bhojraj
194. *Rasarajamṛgānk*	Bhojdev
195. *Rasarājalakṣmi*	Sarvagna Bhatta
196. *Rasarājalakṣmi*	Vishnudev Pandit
197. *Rasarāja Śankar*	Ramkrishna
198. *Rasarājaśiromaṇi*	Parshuram
199. *Rasarājaśiromaṇi*	Revansiddha
200. *Rasarājasudhānidhi*	Brijraj Shukla

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201. *Rasarājasunder (Bṛhad)*	Dattaram Chaubey
202. *Rasarājhaṁsh*	
203. *Rasavarṇana*	
204. *Rasavaridhi*	Mandabya
205. *Rasavidya Ratna*	Shivanand Yogi
206. *Rasaviśwa Darpaṇ*	Harihar
207. *Rasaśāstrapraveśika*	Vaidya Badrinarayan Sharma
208. *Rasa Śāstra*	Atridev
209. *Rasa Śāstra Sacitra*	Vansari Lal
210. *Rasasanketakalika*	Chamunda Kayasth
211. *Rasasangraha*	
212. *Rasasangraha Siddhānta*	Govindram
213. *Rasasanjivaneśwar*	Harihar
214. *Rasasarveśwar*	Vashudeva
215. *Rasasagar*	Chemaditya
216. *Rasasagar*	Gobindcharya (Bhotjatiya Saraswat)
217. *Rasasagar*	Kshemaditya
218. *Rasasāratilak*	Rasendratilak Yogi
219. *Rasasārapaddhati*	
220. *Rasasārasangraha*	Gangadhar
221. *Rasasārasamucchaya*	
222. *Rasasāramṛta*	Ramsen
223. *Rasasaroddharapaddhati*	
224. *Rasasiddhaprakaśa*	Madhav Bhatta
225. *Rasasiddhivimarś*	Somdev Sharma (Sarswat)
226. *Rasasindhu*	
227. *Rasasudhakar*	
228. *Rasasudhanidhi*	Brijraj
229. *Rasaswachanda Bhairav*	Swachanda Bhairav
230. *Rasaheman*	Heman
231. *Rasahṛdayatantra*	Bhikshu Govindapadacharya
232. *Rasānkuś Tantra*	Chandranath
233. *Rasāṇarva*	Bhairavanand
234. *Rasanarva*	Nagarjun
235. *Rasadhikar*	Harihar
236. *Rasadhyay*	Kankali Yogi
237. *Rasanandakautuka*	Narvahan
238. *Rasāmṛt*	Jaidev
239. *Rasāmṛt*	Manikyachand Jain

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240. *Rasāmṛt*	Acharya Yaadbaji
241. *Rasāyan Parīkṣa*	
242. *Rasāyan Prakaraṇ*	Merutung Jain
243. *Rasāyan Sangrah*	Krishna Shastri (Bhatvadhekar)
244. *Rasāyan Saṁhitā*	Prabodhnand
245. *Rasāyan Sār*	Pandit Shyamsundaracharya
246. *Rasālankar*	Rameshwar Bhatt
247. *Rasāvatar*	
248. *Rasāvatar*	Manikyachandra Jain
249. *Rasālok*	Sukracharya
250. *Rasendrakalpdrum*	Ramkrishna Bhatt
251. *Rasendra Cintāmaṇi*	Dhunduknath
252. *Rasendra Cuḍamaṇi*	Somdeva
253. *Rasendra Cuḍamaṇi*	Nakinchdev
254. *Rasendratilak*	Chamund Kayasth
255. *Rasendrapuraṇa*	Ramprasad Sharma
256. *Rasendra Bhāskar*	Siddha Bhaskar
257. *Rasendra Bhāskar*	Lakshminarayan Sharma
258. *Rasendra Bhāṇḍāgār*	Rasendranath
259. *Rasendra Bhairava*	Bhairav
260. *Rasendra Mangala*	Acharya Nagarjun
261. *Rasendra Ratnakoś*	Devdhar Upadhyay
262. *Rasendra Vijnān*	Ramadarsh Singh
263. *Raendra Sampradāya*	Pt. Hajarilala Sukul
264. *Rasendra Sambhava*	Pt. Viswanath Diwedi
265. *Rasendra Saṁhitā*	
266 *Rasendrasuraprabhāva*	Sursen
267 *Raseśwardarśan*	Sāyan
268 *Raseśwarnidhi*	
269 *Raseśwara Sidhānata*	Gorakhanath
270 *Raseśwara Sidhānata*	Harihar
271 *Rasodaya*	Vinayak
272 *Rasopaniṣat*	Krishnagopal Dharmarth Ayurveda Bhawan Kaleda, Ajmer, Publication
273 *Rudrayāmalatantra*	Acharya Srinagarjun
274 *Rasa pradīpa*	*Prāṇanātha's*
275 *Rasoddhāra tantra*	*Jīvarāma Kālidāsa Śāstrī,*
276 *Rasa rāja mahodadhi*	*Gaurī Śaṅkara Tripāṭhī,*
277 *Rasa tantra sāra vā Siddha prayoga saṅgraha*	*Svāmī Kṛṣṇānanda*

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278	*Lakṣmiśwaratantra*	
279	*Lampaṭ Tantra*	Lampat
280	*Lauhsarvaswam (Paddhati)*	Sureshwar
281	*Basavarajīya*	Basavaraj
282	*Vaidyaksārasamucchaya*	Vittal
283	*Vaidyasahacar*	Acharya Viswanath Diwedi
284	*Sahastrarasadarpaṇa*	Mallaswami
285	*Siddhatantar*	Keshavaputra Vopdeva
286	*Siddhasara*	
287	*Sidhbheṣajamaṇimāla*	Ramkrishan Bhatta
288	*Siddhayogasangraha*	Acharya Yadava Ji
289	*Suvarṇa Tantra*	Ishwar Parsuram Samvadatmaka
290	*Sūtapradīpaka*	
291	*Sūtaraja*	
292	*Swachchandabharava*	Balbhadra

Efforts were made to revive *Rasa Śāstra* which was gradually going out of practice. *Śyāma Sundarācārya* and *Bhūdeva Mukhopādhyāya* claimed their personal experience that during *jāraṇa saṃskāra,* mercury digests and assimilates gold without any increase in weight. *Vāsudeva Mūlaśaṅkara Dwivedī* and *Nirañjana Prasāda Gupta* have furnished experimental data which were collected by them during the *saṃskāra* (processing) of mercury.

In the above, only important works are described. Several other works were composed on *Rasa Śāstra* in the past and most of them are lost to us. Their existence is known only from quotations taken from these works by subsequent authors. Most of the original works deal with both *deha siddhi* and *lauha siddhi. Deha siddhi* emphasising upon *sadeha mukti* (attaining the state of salvation while alive), preservation as well as promotion of positive health and cure of obstinate diseases.

Importance of Rasauṣadhi

Lauha siddhi (transmutation of base metals into noble metals with the help of processed mercury) because this is usually kept secret in view of professional ethics.

सिद्धे रसे करिष्यामि निर्दारिद्र्यगदं जगत् । रसध्यानमिदं प्रोक्तं ब्रह्महत्यादि पापनुत् ।।
अभ्रग्रासो हि सूतस्य नैवेद्यं परिकीर्तितम् । रसस्येत्यर्चनं कृत्वा प्राप्नुयात् कृतुजं फलम् ।।
उदरे संस्थिते सूते यस्योत्क्रामति जीवितम् । स मुक्तो दुष्कताद्घोरात्प्रयाति परमं पदम् ।।

र.र.स. १/३१-३२

The other aspect of the *Rasa śāstra* is called *lauha siddhi* or the attainment of perfection in preparing noble metals like gold and silver from ordinary metals with the help of processed mercury. This important aspect of *Rasa śāstra* is, no doubt, described in several *Āyurvedic* texts. But the practice of this science is limited only to a few highly adept saints. The technique of preparing gold with the help of processed mercury is so exciting and so lucrative that there is every possibility of undesirable persons taking advantage of this knowledge and amassing wealth for themselves which in turn may be utilised to the detriment of the society. *Nāgārjuna*, the important propounder of *rasa śāstra* said :

'By attaining *Rasasiddhi*, I will eradicate the poverty (or diseases) from this world' is the pledge or

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reflection which alone is the *Reasadhyana* (meditation of mercury). (Of course, the physicist can perform this by bombarding the molecule of mercury which is, according to the atomic table, nearer to gold. But this process involves enormous expenditure and highly sophisticated equipments and experienced scientists.). The human being will be free from *Brahmahatyadi doṣas* by such a meditation and acts.

Keeping the above reflection in mind, if mica is given as *grāsa* to mercury, that alone in *Naivedya* (offering). By such kind of worship of mercury the merit of performing *yagna* is augumented. After the death at the end of his life span of a man, if there is a presence of mercury in the form of medicine in his stomach, such a man will be free from all the sins and he would attain emancipation.

Apart from curing obstinate and otherwise incurable conditions, mineral drugs were also used for the treatment of common diseases because of advantages as mentioned below :

अल्पमात्रोपयोगित्वात् अरुचेरप्रसङ्गतः। क्षिप्रमारोग्यदायित्वात् औषधेभ्योऽधिको रसः।। (र.सा.सं. ४)

Rasauṣadhī/bhasmas are therapeutically effective even when adminstered only in a small dose (unlike *Kāṣṭauṣadhi*) which are generally required to be administered in a much larger dose). These products are not unpalatable (unlike some of the vegetable remedies which are sometimes very unpalatable because of bitter, astringent and pungent tastes). *Rasauṣadhī* and *bhasmas* produce their therapeutic effects instantaneously (unlike vegetable products which take longer time.

अल्पमात्रोपयोगित्वात्

Generally, the dosage of the *Rasayogās,* is very small. They can be given as less as 125 mg. to 250 mg. It is evident that these are the combinations of various minerals and metals which are highly potent and many a times toxic. Small dosage is sufficient for pharmacological action. But as far as the dosage of the herbal medicaments is concerned, evidently it is very high. The contrast in the dosage is evident.

अरुचेरप्रसङ्गतः

Generally the *bhasmās* and other *Rasayogās* rarely have any taste. They are almost tasteless. This facilitates the easy consumption of these medicines by patients, even in children. Compare this it the unpallatable taste of many herbal preparations e.g. *Nimba swarasa, pañca tiktaka kwātha, sudarśana ghana vaṭī, triphalā cūrṇa* etc. Hence tastelessness is an added advantage.

क्षिप्रमारोग्यदायित्वात्

Being highly potent they can absorb and assimilate in the body quickly, thus reversing the pathology and relieves the symptoms in less time. It is said that, many a times the action starts, as soon as these *Rasa yogās* come in contact with salivary juice in the mouth. It is evident that, most of the drugs used in the *yogās* have to undergo several processes like *Śodhana* and *Māraṇa,* making them microfine, which accelerate the process of absorption and assimilation, bringing about quick relief.

In view of the above, treatment with metallic and mineral preparations was considered to be superior in comparison to treatment with vegetable drugs and surgical therapies as mentioned below :

आसुरी मानुषी दैवी चिकित्सा त्रिविधा मता । शस्त्रैःकषायैःलोहाद्यैःक्रमेणान्त्याः सुपूजिताः।।

Therapies are of three categories, viz., *Āsurī* (demoniac) which includes surgical therapies, (2) *Mānuṣī* (human) which is performed by the use of decoctions, etc. of vegetable drugs, and (3) *Daivī* (divine) which is performed by the administration of metallic and mineral preparations. The succeeding ones are superior to the preceding categories of therapies.

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साध्येषु भेषजं सर्वमीरितं तत्त्वेदिना। असाध्येष्वपि दातव्यो रसोऽतः श्रेष्ठ उच्यते । र.सा.सं १/५

The scholarly physicians can prescribe medicines only for curable diseases, but the *Pārada* can be administered even in incurable diseases. Hence *Rasa* (and its preparations) are superior among all the medicaments. It is claimed that, these *Rasa* and *Rasa yogās* are so potent that, they can even cure such diseases which are pronounced as incurable.

उत्तमो रसवैद्यस्तु मध्यमो मूलिकादिभिः। अधमः शस्त्रदाहभ्यामित्थं वैद्यास्त्रिधा मतः।। र.सा.सं. १

In the field of *Cikitsā,* treatment with *Rasa yogās* is considered to be best among different schools of *cikitsā.*

या दैवी प्रथम सुसंस्कृत रसैर्वा निर्मिता तद्रसैश्चूर्ण स्नेह कषायलेहरचिता स्यान्मानवी मध्यमा।
शस्त्रच्छेदनमास्यलक्षणकृतायाराधमा साऽसुरी-आयुर्वेद रहस्यमेतदखिलं तिस्त्रश्चिकित्साः मताः ।। रसपद्धति

Rasa Vidyā (treatment with *Pārada* and its medicaments) is considered as *Daivī cikitsā,* the devine medicine. In the group of treatments like herbal treatment, which is considered to be *mānuṣī* (human) and medium, the surgical treatment is said to be *Āsurī* (demonic) and inferior, the *Rasa cikitsā* is divine and superior.

भूतल विधेयतायाः फलमर्थास्ते च विविध भोग फलाः । भोगाः संति शरीरे तदनित्यमतो वृथा सकलम् ।।
इति धन शरीर भोगान्मत्वाऽनित्यान् सदैवयतनीयम् । मुक्तौ सा च ज्ञानात्तच्चाभ्यासात्स च स्थिरे देहे ।।
तत् स्थैर्येन समर्थे रसायनं किमपि मूललोहादि । स्वयमस्थिरस्वभावं दाह्यं क्लेद्यं च शोष्यं च ।।
र.र.स. १/३८-४०

However such as enjoyment is possible only through this human body. But this body is only transitory, evanescent. Hence as this is going to be destroyed one day, all the enjoyments are futile. So, man should constantly struggle for the liberation, as this body, the riches and enjoyments are impermanent. And this liberation is possible only though the *Yathārtha Jñāna* (the real knowledge) and *Yogabhyāsa* (Practice of *Yoga*) is the only path for such real knowledge. But such a practice of *Yoga* is possible only by disease free, enduring body. For the endurance or stability of the body, neither herbal medicines, nor metallic medicines as *Rasāyana* (rejuvenators), are capable. For, such a *Rasāyana* substances themselves are unreliable. They may be burnt in the fire, get soaked in the water, dry up in the sunrays. But as mercury cannot be afflicted with such things it is superior, supreme.

काष्ठौषध्यो नागे नागो वंगेऽथ वंगमपि शुल्बे । शुल्बं तारे तारं कनके कनकं च लीयते सूते ।।
अमृतत्वं हि भजन्ते हरमूर्तौ योगिनो यथा लीनाः । तद्वत्कवलितगगने रसराजे हेमलोहाद्याः ।।
र.र.स. १/४१-४२

Herbal drugs are merged in *Nāga* (lead), lead in tin and tin is merged in copper. The copper is absorbed in silver, silver in gold and gold is absorbed in mercury. As the *yogis* (sages) attain immortality or salvation by becoming one with *Śiva*, in the same way *Pārada*, which has taken *Abhraka grāsa* (consumed mica) attains the stability by absorbing all the metals like gold, iron etc.

Mercury-cause for liberation

परमात्मनीव सततं भवति लयो यत्रसर्वसत्वानाम् । एकोऽसौ रसराजः शरीरमजरामरं कुरुते ।। र.र.स. १/४३

Like all the living beings who become one with the Supreme Soul, in the same way all *satvas* (all the *Rasa, Uparasa,* metals etc.) are absorbed in mercury, which is like a king of all *Rasas* (minerals).

Such mercury makes the body ageless and immortal.

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पुराणाः स्युः गुणैर्युक्ता आसवा धातवो रसाः ।। (शा.शम)

While *āsavas, dhātu bhasma* and *Rasauṣadhies* become more potent as the become old.

Rasāyana

The *rasāyana* or rejuvenation therapy is meant to provide the required nourishment to the individual and not merely to the physical body. This very often used term explains one of the properties of *Pārada.* By definition it means whichever matter used for delaying aging and destroying disease is called as *rasāyana*. There are many types and various methods of using *rasāyana* matter.

Metals and minerals including mercury are generally used in *Āyurveda* for the treatment of simple as well as obstinate diseases. These are also used to prevent the occurrence of several categories of diseases. The most important use of metal and mineral in *Āyurveda* is for rejuvenation *(rasāyana)* whcih leads to the preservation and promotion of positive health. These drugs can be used by young and old people alike. In both, these drugs help in the maintenance and promotion of their positive health.

Rasa Śiddhas mentioned in Rasa Ratna Samucchaya

अदिमश्चद्रसेनश्च लंकेशश्च विशारदः । कपाली मत्तमाण्डव्यौ भास्करः शूरसेनकः ।।
रत्नकोशश्च शंभुश्च सात्विको नरवाहनः । इन्द्रदो गोमुखश्चैव कंबलिर्व्याडिरेव च ।।
नागार्जुनः सुरानंदो नागबोधिर्यशोधनः । खंडः कापालिको ब्रह्म गोविंदो लंपको हरिः ।।
सप्तविंशति संख्याका रससिद्धिप्रदायकाः ।। र.र.स. १/२-४

In *Ras Ratna Samucchaya* the 27 number of *Rasa Siddhas* mentioned like *Adima, Candrasena, Lankeśa, Viśārada, Kapāli, Mattha, Māṇḍavya, Bhāskara, Śūrasena, Ratnakośa, Śambhu, Sātvika Naravāhana, Indrada, Gomukha, Kalambi, Vyadhi, Nāgārjuna, Sunanda, Nāgabodhi, Yaśodhana, Khanḍa, Kāpalika, Brahma, Govinda, Lampakanad Hari* who have attained *Rasaśiddhi.*

Nāgārjuna

There are many *Nāgārjunas* in the History of *Āyurveda*. The *tāntric* works like *Kakṣapuṭayogaśataka* and *Tattvaprakāśa* are ascribed to *Nāgārjuna*. The work *Cittānandapatiyasi* found in the form of manuscipt at *Goma maṭha* of Tibet is attributed to him. *Al Baruni*, who visited India in the eighth century, refer to one *Nāgārjuna* a great alchemist who lived a century back. *Hsuan-tsang*, who visited India in the seventh century, mentions an alchemist and scholar *Nāgārjuna* who lived seven or eight centuries earlier. *Harṣacarita* refers to *Nāgārjuna* who presents a garland to his friend *Śatavāhana*, the lord of three oceans. Thus *Nāgārjuna* a contemporary of *śatavāhana*, was an alchemist, physician and expert in *tantra*. *Vṛnda* says of one *Nāgārjuna* that he himself inscribed a medical formulation on the stone pillar at *Pāṭalīputra*, this might be *Nāgārjuna*, the friend of *Śatavāhana.*

नागार्जुनेन लिखिताः स्तम्भे पाटलिपुत्रके ।

The *Nāgārjuna* referred to in *Rājatrangiṇi* by *Kalhaṇa* was a king not a monk. It is the *Nāgārjuna*, whom *Bāṇa* refers to in association with *Śātavāhana*, the *Buddhist* monk and the preceptor in Alchemy. According to the accounts given by *Kumārajīva*, the period of birth of *Nāgārjuna* was 405 A.D.; his birth was under an *Arjuna* tree (Terminalia arjuna) and he learned the science from *Ācārya Nāgaka*. According to *I-Tsing*, *Nāgārjuna* lived in the fourth century after *Buddha*, during the time of *Kaniṣka*; born to a *Brāhmin* of *Vidarbha*, *Nāgārjuna* was educated in the *Nalanda* University of the School of *Śaradabhadra* and became the *Ācārya* after *Śaradabhadra*. The kings *Muñca* of Orissa, and *Bhoja* of *Mālava* were his disciples. He propounded the *Mahāyāna* system, provided *rasāyanas*, curatives

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for eye diseases etc. traveled far and near in search of herbs; invented methods to make gold and silver to combat diseases and famine. A portrait of *Nāgārjuna* with five snakes on his head is popular in Tibet.

The first *Nāgārjuna* was the abbot of *Śrīśaila*. He was a scholar in *Āyurveda*. He was known as the propounder of *mahāśūnya* theory. His affinity was with *mantras* and *tantras*. King *śālivāhana* was close to him, he wrote friendly letters to the king during his travels. They are available in *Bhoṭa* and in Chinese translations. *Nāgārjuna* lived between 154 and 266 AD; the letters were written in 172 AD. The time of *Śālivāhanas* in *dhānyakaṭaka* were from 73 to 218 AD. *Kalhaṇa* says in *Rājataraṅgiṇi* that *Nāgārjuna's* time was 150 years after Buddha's renunciation; but this is mere presumption. Hsuan-tsang, who came to India in 162 AD refers to *Nāgārjuna* in his travelogue; and also two of his works i.e. *Rasaratnākara* and *Rasendramangala*. The former is in the form of questions and answers where *Śālivāhana* leads the discussion. The letter was published by Gundal Chemical Laboratory along with another alchemic work *Kakṣapuṭa* of *Nāgārjuna*. *Kakṣapuṭa* starts with paean to *Buddha* and to *siddhas* one of its stories indicates that there were two *Ācāryas* viz. *Vasiṣṭha* and *Māṇḍavya* before *Nāgārjuna*.

Many *siddhās* reigned on *Śrīśaila* from the period *Nāgārjuna* I to *Nāgārjuna* II (200-800A.D.). There are many a references in Sanskrit literatures which prove that Śrīśaila was a center of *siddhas* up to 800 A.D.

आर्यकनामा गोपालद्वारकः सिद्धादेशेन समादिष्टो राजा भविष्यति । *Mṛccakaṭika (5th century)*

There are references to *śrīśailaparvata* in later works like *Mālatīmādhava, Śrīharṣacarita*, etc.

सकलप्रणयिमनोरथसिद्धिः श्रीपर्वतो हर्षः। *Kādaṁbari*

During this period, *Śrīśaila* and *Dhānyakaṭaka* produced many *mantra-siddhas* and *rasasiddhas*. Only those highly enlightened became masters of the sciences, the process of learning was strenuous and hence the tendency was to keep everything secret. The instruction to the disciples was to uphold the secrecy. The details of the preceptors also were guarded confidentially. The *Buddhist* record in *Bhoda* language is the only source of information regarding eighty-four *siddhas* who came after *Nagarjuna II* (800-1200 A.D.)

According to the rock-inscriptions the period of king *Dharmapāla* of *pāla* was 786-809; *Pātna* was his Capital. During his time a child was born in a *Brāhmin* family. He studied in *Nalanda* and became a scholar. Later he became a *Buddhist* monk and an expert in *mantra* and *tantra* and arrived at the abbey of *Śrīparvata*. As he used to make arrows, he came to be known as *Śarahabhadra;* later he became a *siddha* and moved to *Nalanda*. Thirty of his works were translated into Tibetan. He had three disciples viz. Buddhajñāna, *Śavarapāda* and *Nāgārjuna*; the last two became famous *tantra-siddhas*. Later, this *Nāgārjuna* became the principle preceptor of Chemistry. Harinathji refers to the story of *Nāgārjuna* in the History of *Buddhism*.

A rich, childless family in *Vidarbha*, fed a hundred *brāhmins* in response to a dream and tehy were soon blessed with a son. Astrologers predicted that the child would be short-lived but would live up to seven years if they fed a hundred monks every day. After seven years, the anxious parents sent him to the jungles with servants. One day *Buddha* arrived there incognito and advised to send the boy to the abbey of *Nalanda* to escape from untimely death. *Śarahabhadra,* the then abbot, christened him as *Nāgārjuna* and accepted as his disciple. On completion of studies, both the preceptor and disciple moved to *Śrīśaila*. After undergoing the intense process of *vajrāyana, Nāgārjuna* attained many *siddhis*.

There occurred a famine causing death to many monks. *Śarahabhadra* became concerned. He had heard about a sage who could make gold; the sage lived in island unapproachable to all. *Śarahabhadra*

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directed *Nāgārjuna* to go there. *Nāgārjuna* started, he took two banyan leaves, with one he made a boat and sailed to the island. The sage was surprised and taught him the art of making gold but kept leaf boat with him to prevent *Nāgārjuna's* escape. *Nāgārjuna* however managed to leave with the help of the spare leaf he had concealed. Coming back he obliterated the poverty of the monks. He hen visited *North Kuru*, set up many more *catyās* (abbeys) and temples and composed many books on *mantra, tantra,* alchemy, *Āyurveda,* astrology and other subjects. He became the abbot of *Śrīśaila* after *Śarahabhadra.*

After *Śarahabhadra*, *Nāgārjuna* became the abbot of *Śrīśaila* of *Dhānyakaṭaka.* He had many disciples, amoung them *Āryadeva*, *Nāgabodhi* and *Pankajapāda* were famous. Twenty six works attributed to *Āryadeva* were rendered into Tibetan of which six are on philosophy. *Ādiyogabhāvana*, the work attributed to *Nāgabodhi* was also rendered into Tibetan. Two works of *Paṅkajpāda* i.e. *Anuttarasarvaśuddhikrama* and *Mahāmudrābhāvana,* have come to light. *Nāgaboddhi* had two disciples- *Bhūsuka* and *Virūpāda. Bhūsuka* was a *kṣatriya* prince; later as a *Bhikṣu* he became famous and was known as *Śāntideva,* and seeing his typical life style, the king *Gauḍeśvara* of *Nalanda* named him as *Bhūsuka. Bhūsuka* became a great *Siddha*. There are six works on *darśana* and three on *tantra* to his credit; one among them is a commentary on *Cakrasaṁbharatantra. Virūpāda* was from *trivur* village, and had many disciples eighteen of his works have Tibetan renderings. He was the seer and prospector of *Yāminitantra*, *Dombhipāda* and *Kaṇahapāda* were his disciples. *Dombhipāda* was a *Kṣatriya* from *Magadha* and a follower of *hevajratantra*, his twenty-one works have been recovered from *Nañcūr. Kaṇahapāda*, a *brahmin* from Karnataka (809-849) had five disciples viz. *Dharmapāda, Kantharipāda, Mahipāda, Udhalipāda* and *Bhadepāda* all of them belonged to the eighty-four *siddhas*. Six of there works on philosophy and seventy-four *tantra* works are available. *Āryadeva* and *Pankajapāda* also had many disciples, but little is known about them.

Śavarapāda, another disciple of *Śarahapāda* was an expert in *tantra* and came to be considered as an incarnation of *Lord Śiva*. His *mantras* were effective with a single chant. Twenty-six works of *Śavarapāda* have been found in *Tanjur;* many of them are on *mantras*. He had three disciples viz. *Sarvadakṣa, Lūhipāda* and *Gharmarīpāda. Sarvadakṣa*, son of *Śavari* was a *śūdra;* he was the disciple of *Śavara* and *Bhūsuka*. He was the seer of *aghoramantras* and propogator of the *aghora sect*, two works i.e. *Karuṇācārya* and *Kapāladṛṣṭi* are ascribed to him. *Lūhipāda,* also known as *Rantideva* was a scribe of king *Dharmapāla,* later he became a *siddha.* Some consider *Lūhipāda* as the first of the eighty-four *siddhas* and that his preceptor was *Lord Śiva* himself; but, historically, *śavarapāda* is the first *siddha*. Seven translated works of *Lūhipāda* are available in *Nāncūr*. Among his disciples include the king and minister of *Orissa*; later they became famous and were known as *Dārikāpāda* and *Denkipāda. Dārikāpāda* also became a *siddha* and eleven of his works have Tibetan translations. He had many disciples; one of them was *Sahajayoginīcinta*, a famous female disciple and the other one was *vajraghaṇṭa* who is also known as *Sūryaghaṇṭa* or *Ghaṇṭapāda*; eleven of his works have Tibetan translation, his disciple was *Kūrmapāda. Jalandharapāda* the disciple of *Kūrmapāda* was a *Brāhmin;* he was a *Buddhist* monk and an expert in *mantra* and *tantras;* earlier an atheist he turned to a theist. The systems he initiated became famous and were known as *nāthapanth*. The followers of this system consider him as the protector (*ādināth*). Seven of his works are translated to *Tibetan*. He had many disciples among them, *Ādinātha, Kaṇahapāda, Tantipāda* and *Matsyendranāth* were famous.

Ādinātha (974-1026) earned fame as *Ratnākaraśāntipāda*, and became an eminent scholar; he was a propagator of *Buddhism*. Some believe that he lived for a hundred years, he authored nine philosophical works, twenty-three *tantric* works and one metrical work *Chandoratnākara. Kaṇahapāda* became the disciple of *Virūpāda* and *Jalandharapāda.Tantipāda* was a weaver; his work *Caturyogabhāvana*

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has been translated into Tibetan. *Matsyendranāth* brought up by a fisherman was a disciple of *Carppaṭīpāda*, became famous and was known as *Siddhimīnapāda*. He had two disciples viz. *Gorakhanāth* and *Cauraṅganātha*. *Gorakhanāth* (9th century) moved off from *Buddhism;* propagated theism and founded an independent *nāthpanth*.

The two lines of disciples of *Savarapāda* are referred to already; the third line is of *Dhamaripāda*. His disciple *Carppaṭipāda* was a famous alchemist, *Kukkaripāda* was his disciple. Thus the total number of *siddhas* from the eight to the twelth century would exceed eighty-four. The last *siddha* was *Kālapāda*, the disciple of *Cīlukapāda, Celukapāda* was the disciple of *Maitripāda. Dipaṅkaraśrījñāna*, the disciple of *Maitripāda*, lived in the early eleventh century; his various works are available.

The origin of these *siddhas was* from *vajrāyana* system of *Buddism*. The preceptors of *bhairavīcakra, mantrasiddhi, tantra* and *rasāyana* had substantial with *vajrāyana* system; the centers of this system were *Śrīśaila* and *Śrīparvata*. The *siddhas* emanated from these centers made their own systems and regulations. *Karavālabhairava*, a *siddha,* strewed the knowledge of *bhairavīcakra;* his sect gained popularity in Kashmir and many systems branched out from this like *kulakaula, mahakaula siddhakaula*, etc.; all these are referred to in *Rasārṇava*. *Ānandakanda* of *Manthānabhairava* enumerated the eight-four *siddhas*. *Ānandakanda* refers to many names like *Ādināth (Śarahabhadra* or *Jalandharanāth), Gorakhnāth, Colāndharadeśan (Celukapāda,* the disciple of *Maitripāda), Kanthānīśan (Cicchiṇīpādan,* the disciple of *Kaṇahapāda), Cauraṅgī (Cauraṅgīya), Karpaṭi (Karpaṭipādan), Ghoṇṭi (Ghoṇṭapādan),* Culli *(Celukapādan), Kāmadvaya (Mīnapādan* and *Matsyendranātha), Vyāli (Vyālipāda), Kukkuri (Kukkuripāda), Karṇari (Karṇaripādan* or *Āryadāvan), Ṭiṇṭipādan (Tantipādan), Manthānabhairavan, Siddhabuddhan (Buddhajñānan), Kanthaḍi (Kanthālīpādan)* and *Kapāli (Kapālapādan)*. Many of these *siddhas* were experts in alchemy, *mantras* and *tantras*, all of them kept their forte a secret.

Siddha system of South India

Sage *Agastya* revealed the *siddha* system in the South; scholars differ on the identity of this sage. Some believe that he is a *non-āryan,* other taken him to be the propagator of the *āryan* culture in the South. One story is that he made the Vindhya mountain bow its head and got its promise to keep it bowing till he returned; but he never returned! Everything in the South is attributed to his powers; *Āyurveda* is no exception.

Lord Śiva is believed to be the originator of the *siddha* system. He passed it down to *Godess Pārvati,* she to *Nandi* and he to Dhanvantari. It was handed over in succession to *Agastya, Pulastya* and Teraiyar. Teraiyar had about a score of disciples; these disciples divided themselves into two branches i.e. 1) the Northern-who composed the work in *Sanskrit* or translated the *Sanskrit* works to *drāviḍiyan* languages and 2) the Southern - who wrote their works in *drāviḍiyan*. Most of the works in the *agastya* system are on the applications of mercury. But the tradition differs from that of the North. Alchemy in the South is known as the siddha system.

Historically there are two *Agastyās* who lived in the sixth or seventh century B.C. But the works of *siddhās* belong to the tenth century A.D.; hence the claim that *Agastya* is the *ācārya* of siddha system is only to show its antiquity, We have similar claims on alchemic works in the North also. Many alchemic works in Tamil still remain to be rendered into other languages. Several *siddha* authors like *Bhogar* and *Pulpāni* are said to have come from *China* and mastered tantrism.

The *siddha* medical system influenced the South most; Tamil literature abounds in legends about it, Possibly, the system emerged independently in the South and came under the influence of the Northern system at later stage.

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Reading the pulse is not discussed in *Caraka, Suśruta* or *Aṣṭāṅgahṛdaya.* But ancient *drāviḍiyan* works discuss of reading the pulse and testing urine. May be the knowledge of pulse reading spread from the south to the north.

The medical system of Ceylon is connected with the Buddhist tradition and is influenced by the *drāviḍyan* culture, *Manthānabhairava,* the author of *Ānandakanda,* was the court physician of Ceylon. *Rasaratnasamuccaya* shows that tantricalchemic system of medicine prevailded in Ceylon. Pandit *Gopālācāri* mentions a few works on the medical literature of Ceylon, of which, *bhaiṣajyamañjuṣa* is in Pali, *Sārasaṅkṣepa* in Singhalese and *Sārārthasaṅgraha and Yogaśataka* in Sanskrit; of these, *Yogaśataka,* with Sanskrit commentary, is an abstract of yogas. It is claimed that the work *Yogaratnākāra* to be and abridgement of yoga principles.

Pākaśāstra

Preparation of food and drinks are as important as medicines in a treatment. In olden days physicians supervised the Royal kitchen; *Cakrapāṇidatta* narrates this from personal experience. A physician stayed with the king to ensure his health with balanced and unadulterated diet. Mahabharata describes Nala as an expert in cooking. The work *Nalapākadarpaṇa* is ascribed to him. Another work is *Kṣemakutūhala* of *Kṣemaśarma* (1605 *Vikram* era*).* It describes in twelve chapter the quality of materials, the kitchen, cooking utensils, equipment, methods of identifying poisoned food and the essential qualities of the presiding physican.

HISTORY OF BHAIṢAJYA KALPANĀ

Bhaiṣajya Kalpanā Utpatti

The term *Bhaiṣajya Kalpanā* is formed by the combination of words *Bhaiṣajya (Bheṣaja)* and *Kalpanā.*

भेषं रोगभयं जयति इति भेषजम् ।

The substance through which we can over come the fear of the disease is called as *Bhesaja.*

The substance (medicine) is called *bheṣaja*, because it will over come the fear of disease and also it can be called as *auṣadha.*

In general the term *Bheṣaja* meant the conquest of disease infact, it comprehends two important and vital aspects of medicine and therapeutics viz,

1. Preventive- The Promotion and preservation of health, strength and longevity in the swastha or the healthy person.

2. Curative- The cure of the disease in the ailing and the afflicted.

Different classics of Āyurveda discribed about Bhesaja (Auṣadhi, dravya) like viz.

According to Ācārya *Caraka* the following are the four indispensable for treatment of diseases, namely: Bhisak(Physician), *Dravya* (Medicament), *Upasta* (attendant/nursing personal), *Rogi* (patient). These are the *Cikitsa catuṣpāda* (analogous to four legs) that support a table.

Synonyms of Bheṣaja

चिकित्सितं व्याधिहरं पथ्यं साधनमौषधम् । प्रायश्चित्तं प्रशमनं प्रकृति स्थापनं हितम् ।।
विद्यात् भेषज नामानि ।। (च.चि. १.३)
बहुता तत्रा योग्यत्वमनेकविध कल्पना संपच्चेति चतुष्क: अयं द्रव्याणां गुण उच्यतै (च.चि. १.३)

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बहुकल्पं बहुगुणं संपन्नं योग्यमौषधम् । (अ.हृ.सू. १.२८)

Acārya Caraka further emumarates the mecessary qualification of drugs which after words taken by Vagbata in his book as.

Applicability, rechness of quality, abundance and utility in multi purpose are said to be the best qualities of a drug. Hence *Bheṣaja* is kept in second position among the *pādacatuṣṭaya* because of its great role in treatment grounds.

यथाश्रिता: कर्मगुणा: कारणं समवायि यत् तद्द्रव्यम । (च.सू. १.५१)

A substance which is the constituent cause of its action and properties residing in it is known as a *dravya*.

अथात: स्वरस: कल्क: क्वाथश्च हिमफांटकौ ज्ञेया: कषाया: पंचैते लघव: स्यूर्यथोत्तरम् ।
(शा. सं. म. ख. २.१.१)

Swarasa, kalka, kwātha, hima and *phāṇṭa* are five types of *Auṣadhi* described. The former more potent, latter less potent (in descending order of potency).

योगादपि विषं तीक्ष्णं उत्तमं भेषजं भवेत् भेषजं चापि दुर्युक्तं तीक्ष्णं संपद्यते विषम् । (च. सू. १२६)

With proper (right method of) preparation a poison can become (is converted into) an excellent medicine. Medicine if improperly used becomes a severe poison.

अनेनोपदशेन नानौषधिभूतं जगति किंचिद् द्रव्यमुपलभ्यते तांतां युक्तिमपर्थंच तं तमभिप्रेत्य ।
(च. सू. २६.१०)

As per this advice, in this world, in this world, there are many objects with medicinal properties, whichever substances (drugs) are available, use them judiciously, for serving the purpose in hand.

A substance which is the constituent cause of its action and properties residing in it is (known as) a *dravya* (drug).

शमनं कोपनं स्वस्थहितं द्रव्यमिति त्रिधा । (अ. हृ. सू. १.१६)

Drugs are of three types: *śamana* (producing subsidence), *kopana* (producing aggrevation) and *swasthahitam* (maintaining health).

यथा विषं यथा शस्त्रां यथा अग्निरशनिर्यथा तथौषधमविज्ञातं विज्ञातममृतं यथा । (च. सू. १.१२४)

A drug not perfectly understood is (fatal) like poison, weapon, fire and thunderbolt; a perfectly understood drug is (life saver) like ambrosia.

औषधं हयनभिज्ञातं नामरूपगुणैस्त्रिभि: विज्ञातं चापि दुर्यक्तं अनर्थायोपपद्यते । (च. सू. १.१२५)

A drug whose name and form and properties are not known, and when known , if improperly used can produce disaster.

कुर्यान्त्रिापतितो मूर्ध्नि सशेषं वासवाशनि: सशेषमातुरं कुर्यान्नत्वज्ञमतमौषधम् । (च. सू. १.१२८)

The fall of *God Indra's* thunderbolt on ones head may spare a person but medicine prescribed by an ignorant physician, will not spare the patient.

योगवित्त्वप्यरूपज्ञस्तासां तत्त्वविदुच्यते किं पुनर्यो विजानीयादोषधी: सर्वथा भिषक् । (च. सू. १.१२२)

One who knows uses, names and form is known as *Tatvavita* (knowledgeble), then what would be a *Bhiṣak* (physician) called, who knows everything about medicine.

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तत् पुनस्त्रिविधं प्रोक्तं जांगमौद्भिदपार्थिवम् । (च. सू. १.६८)

Drugs are of three types: *jāngama* (movable- animate), *audbhida* (immovable) and *pārthiva* (mineral).

सेंद्रियं चेतनं द्रव्यं निरिन्द्रयमचेतनम् । (च. सू. १.४८)

A drug is animate (has sense organic) or inanimate (inorganic).

जंगमा: खल्वपि चतुर्विधा: जरायुजाण्डजस्वेदजोद्भिज्जा: । (च. सू. १.३०)

Jaṅgamā (movable-animate) is further classified as *jarāyuja* (viviparous), *aṇḍāyuja* (oviparous), *swedaja* (born of perspiration), *udbhija* (plants).

औद्भिदं तु चतुर्विधम् । वनस्पतिस्तथा वीरूद्वानस्पत्य: तथौषधि:फलैर्वनस्पति: पुष्पैर्वानस्पत्य: फलैरपि । ओषध्य: फलपाकान्ता: प्रतानैर्वीरुध: स्मृता: । । (च. सू. १.९१.७२)

Audbhida have four varieties: *vanaspati* (trees), *vīrudha* (climbers), *vānspatya* (shrubs) and *oṣadhi* (herbs). *Vanaspati* have only fruits (they are nonflowering), *vānspatya* have flowers and fruits (flowering variety), *Auṣadhi*;s life ends on ripening of fruits (annual shrubs and herbs) while *vīrudhas* are indentified by their tendrils.

संस्कार: गुणांतराधानमुच्यते । (च. वि. १.२१)

Lending other properties to the substance is known as *saṁskāra.*

पञ्चभूतात्मके देहे ह्याहार: पाञ्चभौतिक: । (सु. सू. ४६.५२४)

सर्व द्रव्यं पाञ्चभौतिकमस्मित्रर्थे तच्चेतनावदचेतनं च । (च. सू. २६.१०)

जगत्येवमनौषधम् । म किञ्चिद्विद्यते द्रव्यं वशान्ननार्थयोगयो: । (अ. हृ. सू. ९.१०)

द्रव्याणि हि द्रव्यप्रभावाद् गुणप्रभावाद द्रव्यगुणप्रभावाच्च यतू कुर्वन्ति, तत् कर्म येन कुर्वन्ति, तद्वीर्यम् यत्रा कुर्वन्ति तदधि ाकरणम् यदा कुर्वन्ति स काल: यथा कुर्वन्ति स उपाय: यतू साधयन्ति तत् फलम् । (च. सू. २६.१३)

द्रव्यमेव रसादीनां श्रेष्ठं ते हि तदाश्रया: । तस्मात्रैकरसं द्रव्यं भूतसङ्घातसम्भवात् । । (अ. ह. सू. ९.१.३)

The body is composed of five elements so is the diet.

For the purpose of this science all substances are *pāncamahābhoutic* (products of 5 basic elements). Further, substances are of two kinds, animate and inanimate.

Whatever therefore substances(drugs or diet) do by their nature or qualities or both is their action. Whereby they act is the potency. Wherein they act is place. When they act is time, How they act is the mode. What they achieve is the result.

All substances are composed of 5 basic elements. Therefore there is no substance in this world which cannot act as medicine.

Dravya (drug) is superior to rasa etc. because *dravya* is substratum of those properties. *Dravya* can effect many rasas as it is multifaceted.

Universal therapeutic utility of matter

As explained in the preceding paragraph there is nothing in the word which does not have therapeutic utility in appropriate conditions and situations.

Drugs or diet abounding in the properties of a given *mahābhūta* are useful in making good the deficiency of *mahābhūta* in the body.

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There is nothing in the world which does not have therapeutic values and at the same time everything cannot be used for treatment of every disease. A drug is useful in specific conditions and situations; so the selection of drugs is to be made in accordance with the property of its administration and therapeutic needs.

एवमेषां रसानां षट्त्वमुपपत्रां न्यूनातिरेकविशेषन्महाभूतानां भूतानामिव स्थावरजङ्गमानां नानावर्णाकृति विशेषा:,षड्तुकत्वाच्च कालस्योपपत्रो महाभूतानां न्यूनातिरेकविशेष: । (च. सू. च. सू. २६.४०)

In this manner by virtue of the preponderance or paucity of the one or the other of five basic elements, the six categories of *rasa* emerge with varying gradation of preponderance or paucity of protoelements in *rasa*.

विज्ञानं औषधीनां शास्त्रासहितस्तर्क: साधनानाम् । (च. सू. २५.४०)

Specific knowledge about *Auṣadhis* (drugs) is obtained through scientifically based descutions.

द्विविधमेव खलु सर्वं सच्चासच्च तस्य चतुर्विधा परीक्षा आप्तोपदेश: प्रत्यक्षं अनुमानं युक्तिश्चेति । (च. सू. ११.१७)

All the objects in the world are of two types, real and unreal. Therefore it should be examined in four ways : information given by elders (trust worthy), direct perception inference and application of logic(reasoning).

किंचिद्रसेन कुरूते कर्म पाकेन चापरम गुणान्तरेण वीर्येण प्रभावेणैव किचंन । (वा. अ. ह. सू. ९.२२.२३)

A drug acts partly through rasa, partly through *pāka*, partly through *vīryu* and partly through *prabhāva*.

तस्माद्रसोपदेशेन न सर्वद्रव्यमादिशेत दष्टं तुल्यरसे अप्येव द्रव्ये गुणान्तरम् । (च. सू. २६.५२)

One should not advise about the drug by advising about its *rasa* only (a drug does not act through *rasa* alone) because even when *rasa* of drugs is similar, actions of drugs may differ.

तद्यथा-पुरुषो बहूनां कर्मणां कर्मणां करणे समर्थो भवति तद्वदौषधद्रव्यमपि द्रष्टव्यम् । (च. सू. ४.२२)

One should know just as a person is capable of performing many actions so is a drug. An *Auṣadha* (medicine) is regarded similar to man who is able to perform deverse functions.

Commenting on this word *Kāśyapa* told that

भिषाग्विज्ञाननेयत्वाद्भेषजं भिषजो विदु: । भिषग्जिते हितत्त्वाच्च भैषज्यं परिचक्षते ।। (का. सं.)

Since it is able enough to be learned it is known as Bhesaja bu the bhisak. From which a bhiṣak gets profitable results, he calls it by the name Bhaiṣajya (Bheṣaja).

भैषज्याहार चेष्टानां यो न वेन्ति गुणागुणम् । न सवेन्ति भिषक सम्यक स्वस्थास्वस्थहिताहितम् ।। अत: समस्तवस्तुनां गुणदोषं विनिश्चय: । ज्ञातव्यों यन्तत: सद्भिवैद्य: परंहिताभि: ।।

A physician who is not acquainted with the good and bad effects of drugs, diet and regiment does not correctly know the things which are useful and harmful for healthy persons and patients. Therefore a good physician who desires the well fare of others should ascertain the good and bad qualities of all these things.

Along with these the author of *Hemakośa* was told that

द्रव्यं भव्य धने क्ष्मादौ जन्तुर्द्रुमविकारयो: । विलेपे भेषजे रित्याम् ।।

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Bheṣaja (Auṣadha) can be reffered as *dravya*, but *dravya* can be *dhana* or *kṣmada* or *bhāvi* etc. But *Bheṣaja* is only ment for the vikāra, roga of *Jantu* (animal) and druma plants). So in general

वैद्यो व्याधि हरेद्येन तद्द्रव्यं प्रक्तमौषधम् ।। (अत्रिसंहिता)

By which, the vaidya is treating the *vyādhi* of the rogi i.e., known as *Auṣadhi*. Caraka also have similar opinion but he given more stress to the healthy condition and says that for maintaining the healthy condition the *Upakaraṇa* which helps the *Vaidya* is said to be as *Bheṣaja*.

भेषजं नाम तदुपकरणायोगकल्पते भिषजो धातु समाम्यात्रि विर्वृत्तौ प्रयतमानस्य ।। (चरक)

That medicine is a right one and pure one which cures a disease physical, mental and spiritual and does not gives reses to adverse reactions and does not reate other diseases.

Auṣadham

औषधिभिर्निब्पन्नं व्याधिहितं तदुपलक्षण । त्वात् सर्व चिकित्सितमौषधं रुढ़म् ।। (गङ्गाध)

As told by ancient scholors always *Auṣadhi* will be hita for the rogi. *Auṣadhi* wordcame as *upalakṣaṇa* (upa referes to *upasarga*). But *Kāśyapa* says.

ओषो नाम रस: सोऽस्यां धीयते यन्तदोषधि: । ओषादरोग्यमाद्यत्ते तस्मदोषधिरोषध: । (का. सं.)

That which bears the *ouṣa* (it is also known as *rasa*) is known as *Auṣadha*. By this osa we will get *arogya*. Hence *oṣadhi* is nothing but *Auṣadha* only. In general, *Auṣadha* means the things which are prepared from drugs for the cure of the disease and to attain health.

तदेव युक्तं भैषज्यं यदारोग्याय कल्पते ।। (चरक)

This includes all types medicaments. *Bhaiṣajya, Bheṣaja, Auṣadhi, dravya* etc.

It is seen from the above that all these term indicate different aspects of *Bheṣaja* (medicament), some of these indicate what they do, and some others what they achive, Irrespective of the distinctions they carry in their literary meanings, all of them in the present context mean *therapeutic devices* employed for the treatment of diseases .

The substance, where in exist the properties and actions on a unseparable relationship is called *Dravya* or *Bheṣaja*. The properties and actions have no identity or existence without the substance and the substance has no recognition without the properties and actions.

In a broad sense, therefore any substance or mixture of substances intended to be used internally or externally for the preservation and strengthening of health and for the prevention, cure of disease of either man or animal is call *Bheṣaja* or *Auṣadhi*. Obviously, both the dietetic and medicinal substances are *Auṣadhas* in this context.

Acārya Caraka has observed, in the light of this knowledge, there is in the world no substance that may not be used as medicine for this or that purpose. Purposiveness and rationality or the two parameters to judge and use any substance as medicine.

Kalpanā

Kalpa śabda is originated from ''कृप् सामर्थ्ये'' धातु and अचू व धञू प्रत्यय Different *kośa granthas* describes about *kalpa (Kalpanā)* as mentioned below

कल्प: विधि विधाने संस्कारे । कल्पे विधि क्रमौ । (अमरकोश)

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क्रमं कल्प प्रयोगाणां कल्पं तत्रा प्रचक्षते ।

It can be concluded that, *kalpa (Kalpanā)* means 'विधि, विधान, संस्कार, प्रयोगविधि'

कल्पनं योजनमित्यर्थः । (अरुणदत्त) कल्पनं उपयोगार्थप्रकल्पनं संस्करणमिति । (चक्रपाणि)

According to *Ācārya Aruṇadatta* and *Ācārya Cakrapāṇi*, *Kalpanā* means *Yojana* (planning) or usage of *Saṁskārita Bheṣaja*.

Hence *Kalpanā* is the process through which, a substance is prepared into medicine form by using some raw materials according to the physician's requirement.

Different *Acāryas* of *Āyurveda* mentioned about *Kalpanā* (of *Bheṣaja-Auṣadhi*) are described below:

संस्कारो हि गुणान्तराधस्नमुच्यते। ते गुणासतोयाग्रिसन्निकर्षशौचमन्यदेश कालवासनभावनादिन्त्रिः कालप्रकर्षभावना दिन्नि अधिवन्ते ।। (च. वि. १.२१-२२)

The *Auṣadha kalpanā* is prepared by different processing techniques applied to the crude drugs. this processing results in to transformation of good pharmacological actions to that of substance.(Lending other properties to the substance is known as *Saṁskāra*).Usually performing processing techniques are by dilution, application of heat, cleansing, churning, storing, maturing , flavouring, preservation in container etc.

तथायुक्ते हि समुदये समुदायप्रभावतत्वमेवमेवोपलभ्य ततो रसद्रव्य विकारप्रभावतत्वं व्यवस्येत् तस्माद्रसप्रभावतश्च द्रव्यप्रभावतश्च दोषप्रभावतश्च विकारप्रभावत च तत्वमुपदेक्ष्यामः । (च. वि. १/११-१२)

When formulation is employed, one should ascertain the one collective *prabhāva* of the formulation, on particular combination of *doṣas*. Hence we shall expound the *rasa-dravya-vikāra-prabhava-tatvam* that is the principles of actions with respect to *rasa, doṣa* and disease.

समानानां द्रव्यगुणकर्मणां वृद्धौ प्रयोजकं सामान्यम् । (From comentary by Gangadhar)

That is why we shall advise (instruct) that the principle with due considerations to increase properties of drugs, a drug with similar properties should be employed.

तन्नखल्वनेकरसेषु द्रव्येष्यनेकदोषत्मकेषु च विकारेषु रसदोष प्रभावमेकैकश्येनाभिसमीक्ष्य ततोद्रव्यविकारप्रभावतत्त्वं व्यवस्येत् । (च. वि. १.९)

In case of a disease involving multiple *doṣa*, using drugs with multiple *rasa*, one should separately examine *rasa doṣa* and *prabhāva* of individual durgs and determine application of *dravya- vikāra-prabhāva*.

औषधं चापि दुर्यक्तं तीक्ष्णं सम्पद्येते विषम् विषं च विधिना युक्तं भैषज्यायोपकल्पते । (काश्यप संहिता)

Ācārya Kāśyapas concept regarding importance of *saṁskāra* (Pharmaceutical process) of *Bheṣaja*. Even medicine that is not prepared properly terns to *viṣa* in contrast if *viṣa* is prepared according to rules and regulation it can be used as in the form of medicine.

अल्पस्यापि महार्थत्व प्रभूतस्याल्पर्मताम् । कुर्यात् संयोगविश्लेषकालसंस्कारयुक्तिभिः ।। (च. क. १२.४४)

देशकलमुण्येन संगृहीतं यथा विधिः । स्थापितं भेषजं तैस्तैः कल्पनैरमृतायते ।। (भेषजकल्प १/२)

There is no letter which is not a mantra (incantatas) there is no root which is not a medicine and there is no human being who is not useful. Only their yojaka (coordinator) is a rare commodity.

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If raw drugs are collected according to *deśa, kāla, guṇa* as told in classical reference of *dravya saṅgrahana*. By these *Bheṣaja* is prepared and this *kalpanā* is considered as equal to that of *amṛta*.

This is the process, through which, a substance (*vanaspatica, prāṇija, khanija* and *āhāra dravyas*) is convereted in to medicine form according to the physicians requirement.

After concluding the opinions of *Ancient Āyurvedic scholors* regarding *Bheṣaja* and *Kalpanā* it can be understood that *Bhaiṣajya Kalpanā (Āyurvedic Pharmaceutics)* forms a branch of *Āyurveda* which mainly deals with *collection* and *selection* of *Drugs*, *Purification study of their nature and combination as well as preparation, preservation, besides mode of administration and posology (dosage)*. The ancient *Āyurvedic Scholors* are very much rational and have a strong scientific back grounds in fundamental Principles which are concerned with drug manufacturing. *Āyurvedic* doctrine tells *to treat the patient as a whole and not the disease alone*.

Bheṣaja (Auṣadham)

Drug therapy, as a separate, branch is very well developed in *Āyurveda*. The study of drugs is as elaborate as in modern pharmacology and we find remarkable similarities and also differences in approach.

A *dravya* (drug) is defined in *Āyurveda* as a substance which has its inherent *guṇa* (properties) and karma (actions). *Ācarya caraka* has explained this further by saying 'a drug is like a fabric, its *guṇa* (physicochemical properties) and *karma* (actions) are like the yarn of the fabric.'Through these properties a substance is capable of altering the environment of the body even if it is not intended for medicinal purpose. Therefore, even dietary constituents, by their *guṇakarma* are capable of acting as drugs. This definition leads to a widening of the horizon for inclusion of substances in the category of what we, in today's terminology, label as drugs and prompts *Caraka* to write "there is no substance in the world which cannot be used for medicinal purpose. An appropriate substance only needs to be used appropriately to be effective". Modern pharmacology restricts the definition of drug to substances which are intentionally used to alter the physiopathological state of the body or for diagnostic, therapeutic or prophylactic purposes.

In spite of this basic difference between the two systems of medicine in understanding the extent and the scope of actions of drugs the functions or qualities expected of a drug remain the same.

It is interesting to read *Caraka's* comments on drug usage which are as remarkable as his philosophy about principles of therapeutics discussed earlier, He says, "Substances are classified into three groups, some rectify the discordance of body elements, some vitiate body elements and some are conducive to the maintanance of good helath". Further he adds , "a drug that is not understood perfectly is comparable to poison, weapons, fire and thunderbolts while the perfectly understtod drug is comparable to ambrosia'. " The drug whose name, form and properties are not known and which is not properly administered, will cause disaster" and as cited earlier "A medicine used whuile relieving symptoms of one disease should not raise some other problems".

In *Caraka's* opinion even a potent poison is converted into an excvellent medicine by the right method of preparation and usage while even a good medicine may act as a strong poison if improperly administered. He stresses the importance of thorough knowledge of drugs by writing " Therefore the intelligent man who desires helath and a long life should not take any medicine prescribed by a physician who is a stranger to the art of application. One may survive the fall of thunder on one;s head but one cannot expect to escape the total effects of medicine prescribed by an ignorant physician:"

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His appeal to the physician therefore, is to know the drugs thouroughly, including their indentification, preparation, properties and usage.

Āyurvedic pharmacology developed into several branches, comparing to those on modern pharmacology as shown below:

Dravya (Drugs)

- *Padārthavijñana* Physical Properties
- *Dravyavijñāna* Pharmacological Properties
  - *Nāmarupavijñāna* Identification (Pharmacognosy)
  - *Kalpavijñāna* Preparation (Pharmacy)
  - *Yogavijñāna* Administration (Clinical Pharmacology)
    - *Guṇakarma vijñāna* Effect on various Systems (Pharmacodynamics)
    - *Prayoga vijñāna* Aplication in different diseases (Therapeutics)
      - *Guṇavijñāna* Study of Properties
      - *Karmavijñāna* Study of Effects

A close resemblance is similarly observed in the classification of drugs in the ancinet and modern systems.

In *Āyurveda, drugs* are classified in different ways according to their sources, utility, effects or morphology. *Caraka* classified durgs into three groups, as shown below:

Dravya

- Jaṅgama (animal original) e.g. cow's milk etc
- Audbhida (Vegetable origin)
  - Vanaspati
  - Virudha
- Parthiva (Metals, minerals etc. e.g. gold etc.)
  - Vānaspatya
  - Auṣadhi

Pharmaceutic Factors

In *Āyurvedic* pharmacology, pharmacy *(Kalpavijñāna)* is a well advanced branch. Crude drugs are rarely administered. Various formulations ranging from simple distillates *(arkạ)*, decoctions *(kwātha)*, linctus *(leha, avaleha)* and powders *(cūrṇa)* to elaborate pharmaceutical preparatioons like pills of differeent sizes (*vaṭi, guṭi, modaka*) and medicated oils *(taila and ghṛta)* are available. In liquid formulations too, a wide range exists. These are *swarasa* (fresh juice), *kwātha* (decoctions), *phāṇṭa* (infusion in hot water), *kṣirapāka* (decoction in milk), *Taṇdulajala* (decoction in rice washings) and alcoholic extracts. The potency is highest in fresh juice and lowest in cold water infusion.

The ancient scientists have also given certain general principles about the shelf life of the preparations. Cūrna (powders) lose their potency in two months but different types of pills remain effective for almost a year. Formulations containing mercury and sulfur remain potent for much longer. In fact, the

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rule is that the older the formulation, the better its efficacy, *Āsava* (alcoholic extracts) improve in potency if allowed to mature over a period of time.

In the absence of modern technological aids, simple guidelines are given to be followed during the manufacturing process. For example, "a candle held over a cask containing incompletely processed *Āsava* would be extinguished (due to generation of carbon dioxide) as the fermentation process continues, while the tank of *Asava* ready for use will let the candle burn and will be as clear as water to show mirror like reflection of ones face."

A part from this, there are instructions about which parts of the plants are to be used, whether it should be fresh or dry and what should be the time of collection. It is stressed that the pharmacognostic knowledge (nāmarūpavijñāna) is essential, along with knowledge of physicochemical properties and effects of durgs. The observations and the inferences drawn by ancient scientists, regarding the plant material, appear very rational on the background of recently accumulated knowledge about the variation in phytochemical content of plants, which is known to occur depending on place and time of collection. One of the earliest studies in this respect was carried out by Biswas in 1956 . He showed that the root of Rauwolfia serpentine yielded different quantities of the alkaloid reserpine when collected from different places, at the same time, The root of the plant collected from the Kumani forest yieled 1.6 per cent alkaloid, and that from Kanchollari forest 1.4 percent, while the specimen from the local markets of lucknow gave 0.8 percent. 1.2 percent yield was obtained from the roots collected from the "medicinal plants cultivation area."

The same plant at the same place may yield diffeerent amounts of alkaloids in different years or at different times in the same year. This may be related to the maturity of the plant and also to the environmental factors. In a survey, Choudhary reported variation in the ratio of hyoscine/ hyoscyamine depending on the maturity of the plant, Datura starmonium from which it is obtained. In the immature plant the ratio is 80:20 while in mature plants it is almost reversed to the extent of 30: 70.

It has also been shown that the nature of the solvent used in extraction can alter the activity of a plant preparation. Similarly, alteration of the inorganic consitituents of the plant like K+ can change activity of formulation.

On this background, thus, the instructions to the physician about the mode of collection, storage and transport in addition to the time and place of collection appear quite logical.

A point to note is that *Āyurvedic physicians* have mainly relied on a combination of drugs rather than a single drug. Administration of drugs in combination *(samyoga)* may either enhance or antagonize the respopnse of the individual component. The mutually supporting or enhancing aspect of combinations is known as *sarvakarmaja* (synergy) and the antagonizing effect in known as *dwandakarmaja* effect.

In compounding a formulation, incompatibilities between constituents are also considered. They are classified as *mānaviruddha* (quantitative antagonism), *guṇaviruddha* (physico-chemical antagonism) and *karmaviruddha* (physiological antagonism). A good deal of discretion is thus essential in formulating drug combinations.

One of the requirement for drug action is its delivery to the site of action. Certain drugs are known to act on certain tissues of the body. In other words, a particular drugs may show affinity for a particular tissue. This is described as *adhiṣṭhāna*, which can be interpreted as "site of action". This has to be necessarily differentiated from the place where the drug may accumulate. Modern knowledge recog-

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nizes affinities or actions of drugs only on certain tissue of the body e.g. digitalis acts on heart, though it may accumulate in muscle.

This fact is applied to a great extent in *Āyurvedic practice*. An ideal drug according to *Caraka* is effective easily available and can be compounded in different formulations to suit the requirement of the patient. *Āyurveda* prescribes drug combinations of facilitate delivery of a drug to its site of action. Piper longum has affinity for liver, while Catechu has affinity for skin and these plants are incrorporated in formulations intended for activity on that particular organ. Thus the concept of *'gamitva'*and *vāhatva* affinity and carrying capacity respectively are important in *Āyurveda*.

The concept of targeting drugs to their site of action was introduced by Paul Ehlrich in the early part of this century with the term " magic bullet". This science, dealing with site specific delivery of drugs, has taken firm roots in modern medicine only after th pioneering work of Christian de Duve on liposomes in 1970. Since then moodern pharmacologists have made several attempts at developing sophisticated drug delivery systems like liposomes, ghost erythrocytes, monoclonal antibodies etc. All these systems share, at least at present , the common problems of being highly complex, expensive and often toxic in humans.

Ghṛta and *taila* are very attractive techniques described in *Āyurveda* which use the process of incorporating drugs in oily particles to target them to their site of action. Similar pharmaceutical principles are utilized in formulating preparations for topical use, where extensive details about drugs and their action on different layers of skin are given. If therefore appears that the *Āyurvedic* method of combining plants to target one of them to a certain organ needs greater exploitation in research.

Compound formulations were also made to improve the palatability making oral administration easy. During later centuries combinations where made using mercury or sulphur to retain the activity of plants and increase their shelf life. These are techniques described which retard the release of drugs in the stomach facilitating its delivery to the intestines (parpati).

Methods are described to be used to modify an otherwise toxic medication into one suitable for human use. One of these techniques is *saṁskāra*. The translation of *saṁskāra* as ' refinement' fails to convey the meaning. *Saṁskāra* aims at alteration of properties. It includes processing before administration with specific objectives : the aim could be to reduce the toxicity or undesirable effects of a drug or to increase its efficacy. One of the techniqes of *saṁskāra* is known as *śodhana*' : process of purification. *Śodhana* is the process by which all the three types of impurities, viz. Physical, chemical and natural are removed.

This process is rigorously used in cases of minerals and plant products like croton seeds, nux vomica, aconite etc., which are known to be toxic substances but are administered with beneficial effects in *Āyurveda*. Croton oil is a potent purgative : it is known as a drastic purgative' in modern pharmacology. The *Āyurvedic* pharmaceutic technique combines it with Cordia wallichii which is slimy in character and reduces its irritant property. This is why *Āyurveda* propounds that " with proper manipulation even a poisonous substance can be medicinally used". It would be appropriate to add here that the corollary of the quote cited above is " medicine wrongly used can be poisonous".

Another example which we would like to quote is that of *guggulu*. *Guggulu* is a gum resin obtained from the tree commiphora mukul. This is recommended in *Āyurveda* for conditions like arthritis and hyperlipidemia. The drug is to be used only after purification The material tied in the muslin cloth is kept in plain or medicated boiling water e.g. decoction of *triphala* (mixture of Emblica officinalis,

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Terminalia chebula and Terminalia beheda) or certain other plants like Bauhinia variegata and Boerrhivia diffusa.

It is interesting to go through the modern process of extraction of guggulipid from *guggulu*. Gum resin guggulu has two fractions . one , an insoluble gum fraction which is toxic and the other soluble with hypolipidemic and anti- inflammatory properties. The hypolipidemic portion is neutral while anti-inflammatory portion is acidic.

The *Āyurvedic* procedure therefore appears to be a sensible way of purifying *guggulu*, because in the process the toxic resinous insoluble part is removed. The soluble part melts, oozes out and comes as a layer on the boiling water .

The choice of plants for the medicated water used for purification of guggulu depends on the patient profile : e.g. *guggulu* extracted in infusion of Bauhinia verigata *(kānchnar guggulu)* is used specifically in cases of lymph nodular swellings, while *triphala guggulu* is used for obese patients with arthritis. *Punarnava guggulu* is recommended for arthritis associated with excessive swellings of joints. It appears that ancient scientists used complex methods for selective extraction of different phytoconstituents for selective use.

We have till now seen the richness of *Āyurveda* in terms of pharmaceutical methods and attitudes, which overshadowed other aspects of pharmacology.

Depending upon this basic fundamental concept, approach of the *Āyurvedic* phyarmaceutics differs from western pharmaceutics in which now a days isolating the alkaloids or other principles from the main drug and using them therapeutically is practised one such example is *Reserpine*, an alkaloid isolated from *Rauolfia serpentine sarpagandha* an anti-*hypertensive* drug. Hence all the *Āyurvedic medicines* were formulated to achieve *preventive, protective, curative and nutritive* qualities from administered drug. While manufacturing different fundamental aspects were explained as mentioned below.

Qualitative Aspects of Auṣadha- Kalpanās (Āyurvedic formulations)

A great amount of stress has been given on the qualitative aspects of drugs, to be selected for preparation of formula.

The collection of raw drugs should be based on the specific guidelines mentioned. A herb should be collected from a particular place, direction and time etc. specified for that herb. Though all these preconditions were looked as irrational, but they have scientific basis, because on account of various ecological factors. This is stronlgy suggestive by Research in Botany as well as Ethnopharmacology shows that herbs when collected according to the specifications mentioned in the *Āyurvedic* books shows that the active principles of the herbs are present in abundant quantities during a specific time in a day and in the herbs from a particular region. As the different parts contain different properties, only those parts which contain the medicinal properties are said to be used in the mentioned formulas. *Pancānga* or the whole plant is indicated for medicinal used. Eg. *Bhūmyāmlaki* (phyllanthus niruri). This may be because, herbs which are very small and which posses uniform active principles in all their parts are prescribed. Hence whole drugs were used by the *Āyurvedic physicians* because of pharmacological and economical reasons. Hence it may be said that *pāñcabhautika* character of *dravyas* prominently occupied the minds of the *Āyurvedic physicians* and not the analytic and synthetic methods.

Quantitative Aspects of Auṣadha- Kalpanās (Āyurvedic formulations)

The relevant portions in the treatises and texts on *Ayurvedic pharmaceutics* apart from the qualita-

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tive aspects also specify the ratio and amount of drugs to be taken for different formulations. A sceptic look, into these shows that if the quantitative fundamentals specifically mentioned for the respective preparations should not be changed, if changed , then the quality of the medicine suffers or the preparation may totally go wrong. E.g., in the preparation of any medicated oil *(taila)*, the *Kalka*, *taila* and *dravadravya* are taken in the ratio of 1:4 : 16 in general .Instead of taking one part of the Kalka, if three or four parts are taken, the moisture content of the formula may be increased and its shelf life will decrease, or the final product may have a different medicinal value. Alterations in any of the above three *Kalka-taila- dravadravya* would either increase or decrease the period of processing, due to which the preparation will not be upto the required standards, and cannot be preserved for long.

Basic fundamentals of Processing techniques

To make a substance eligible for preparation of formula or to get the desired effect or to suit the purpose, it should undergo different processes. These processes are called *saṁskāras*. *Saṁskaras* effect the changes in the properties of drugs. These are brought about by various units of operations, like trituration, treatment with heat, treatment with liquids, washing , stirring, preserving in various places for prescribed period, using particular type of containers, treating with various other medicaments, E.g. trituration with some dravadravya effects the atomisation of substance. This phenomena will facilitates by raising the potency and effectiveness of the drug, while nullifying the toxicity. Smaller (microfined) doses are effective and economic, and devoid of adverse reaction, rapid response too is noticed.

A drug become *Auṣadha* or Medicine only when it is subjected to *Kalpanā, Kalpanā* means presentation. The nature of the drug governs the type of *Kalpanā* to be prepared from it. Hence, the drugs were prepared in different forms due to various reasons.

There are different *Auṣadha Kalpanās* or processing techniques of different dosage forms prescribed in *Āyurvedic* literature. Depending upon the drug and its effect on the body. So many forms have been described.

Yogas or Compound Formulations

The formulas which were formulated by ancient scholars, seems to be have strong scientific basis and giving surprising results in clinical grounds. Because the fundamentals are used for preparation are correct. Yogas are mainly formulated by mixing the drugs which have equal characters are agonising characters too and also based on by different other principles, E.g. in trikaṭu, pippali, marīca-śuṇṭi are said to be mixed together in equal ratio. This is because all 3 ingredients contain *dipana* and *pācana guṇa*. Which is having definite therapeutic action. Another example is that, wherever *vatsanābhi* formulas are mentioned, there *tankaṇa* (Borax) also mentioned because of its definite antidote action against *vatsanābhi*. This facilitates that *vatsanābhi* toxic effects are nullified by *tankaṇa* and same time its therepeutic values will be achieved. The basic fundamental principles of drug manufacturing mentioned in *Āyurveda*, which are definitely having scientific basis, are seems to be better to fallow as it is by all *Āyurvedic Physicians* and as well as *Āyurvedic* drug manufacturing professions present in national and international grounds.

Benefit of drug combination

It is observed that the "Activity" of certain drugs are activated or catalyzed or accelerated by means of combination. This is explained in ancient texts as *yogaprobhāva* (*yoga*=compound, *Prabhāva=visiṣṭa kārya*) means formulation is getting a higher potency when proper drugs are combined. This principle is important in therapy as the number of drugs commonly given during one epi-

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sode of illness, tends to increase with ready provision of an excess for all purpose and also effect of one drug can also be modified by the presence of another. With drug combination bellow mentioned objects can be achieved.

1. To potentiated drug action.
2. To avoid severe drug reaction
3. To save time and money
4. When single drug fails to meet therapeutic need.
5. For double beneficial effects.
6. When physician confused in differential diagnosis or in assessment of proportionate preponderance of *Doṣa*.
7. In *dwandwaja* or *tridosaja* disease.
8. In a drug which is having characteristic feature to provoke a *doṣa*, with or without its main action, that can be counteracted by the addition of another drug to get its main action in disease of that *doṣa* which was supposed to be provoked.

These are basis of such large number of formulations existing in *Āyurvedic science*.

Interaction of drugs and synergism in the body

In therapeutic practice frequently more than one drug is administered at the same time. Two drugs, given at the same time may either 1. Action entirely indepentdent on two separate sites.2. procude similar actions on the same organ : Synergism (Greek: Syn= together; ergo= work), 3. Oppose each others actions : antagonism.

Synergism

There are various ways for drugs to act in concert.

Summation or addition

The two drugs have similar actions which are simply additive i.e. *Śwāsa Kuthāra Rasa and Madhu* (honey) each may cause anti histaminic effect. If the two drugs are administered together, the antihistaminic effect is simply an addition of the action of the two individual drugs (i.e. 2+2=4).

Potentiation

Drug A ' enhances the action of drug B'. If drug A, the potentiator, has its own action of drug of B, the combined action of A and B will be greater than the simple algebraic sum of the action of two i.e. *Śwāsakuṭhara Rasa* act as potent expectorant because it slowely clears the air passages. *Kanakāsava* is a liquid form of medicine which also have expectorant property as well as it strengthens the respiratory system.

Stability

The preservation and storage procedures described in *Āyurvedic pharmaceutics* are also based on scientific lines. The fact that the *cūrṇas* (powders), *tailas (oils)*, *ghṛtas (ghee)* etc. become unstable after the respective periods. The ever- lasting shelf – life of *Āsavas* and *Ariṣtas* mentioned in the texts could be very well related to the alcoholic medium of these preparations.

Bhaiṣajya Kalpanā Itihāsa and Kramika Vikāsa

The total history of *Bhaiṣajaya Kalpanā* can be deivided into various periods for its precise description purpose, as mentioned below.

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Vedic period

The earliest Indian records are the Vedas. *Āyurveda*, the *Upaveda* of *Atharva Veda* has given formulations for the treatment of many human ailments. The *Bhaiṣajya Kalpanā* history starts from vedic period, in other words *Bhaiṣajaya Kalpanā* was got foundation during the *vedic period* itself. Evidences of *Auṣadha* and *Āhāra Kalpanās* are present in *Vedas*.During the *vedic period*, *ekamūlika* prayoga was more in practice. *Swarasa*, *Kwātha*, *cūrṇa* etc. are prepared with different herbs. Hence basic foundation of *Auṣadha nirmāṇa* was made during Vedic period only.

More medical description was available in *Ṛgveda* regarding different *Auṣadhies* e.g. *kimsuka (palāsa)*, *khadira*, *dūrva*, *kamala* etc. soma is considered as more important *Auṣadhi* and *somarasa Kalpanā* is mentioned in *Ṛgveda*. Apart from this, *Abhiṣava Kalpanā* etc also mentioned in *Ṛgveda*.

In *Atharvaveda*, description of *Auṣadhies* e.g. *Apamārga, arka, aśwatha, khadira, tila, arjuna, yava, pippali, pṛśniparnī, bilwa, udumbara, ikṣu, lakṣa, sahadevi, soma, guggulu* etc and *Sura Kalpanā*, *Madya Kalpanā* etc., *Kalpanās* are also mentioned.

In *Yajurveda, Saktu, Parīvap, dadhi, soma, madhu, godhuma, masura, mudga maśla, tila, priyangu,* etc. are mentioned.

Different kalpanās mentioned in *vedic literature and their similar Kalpanās* of *Bhaiṣajaya kalpanā* are mentioned here under.

Kalpanā mentioned in Vedas	**Similar *Kalpanā* of *Bhaiṣajya Kalpanā* to that of *Kalpanā* mentioned in *Vedas***
1. *Somarasa- nirmāṇa*	1. *Swarasa Kalpanā*
2. *Making pāka of auṣadhies in milk*	2. *Ksīra pāka*
3. *Ariṣṭa*	3. *Ariṣṭa*
4. *Madhya-nirmāṇa*	4. *Sandhāna Kalpanā*
5. *Āsavi*	5. *Āsava*
6. *Dadhi*	6. *Dadhi*
7. *Takra*	7. *Takra*
8. *Navaīta*	8. *Navanīta*
9. *Sarpi*	9. *Ghṛta*
Ghṛta	
Ājya	
Ayata	
10. *Lāja*	10. *Lāja*
11. *Odana*	11. *Odana*

Samhitā kala

All the main classical works on *Āyurveda*, such as *Caraka Samhitā*, *Suśruta Saṁhita*, *Kāśyapa Saṁhitā*, *Bhelasaṁhita*, *Aṣṭāṅga saṅgraha*, *Aṣṭāṅga Hṛdaya* deals with drugs, their composition and action in addition to the other aspects of the medical system.

There are many authentic books on both the groups of compound formulations (*Kāṣṭhauṣadhis* and *Rasauṣadhis*). While *Śārṅgadhara Saṁhitā*, *Cakradatta*, *Bhaiṣajya ratnāvali*, *Bheṣaja Kalpa*,

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Sahasrayogam, Bharat Bhaiṣajya Ratnā kara etc., deals with both the groups of formulations, others like *Rasendra Sārasaṅgraha, Rasaratna, Samuccaya, Rasaprakāśa sudhākara, Āyurveda Prakaśa, Rasataraṅgiṇi, Rasayogasāgara* etc. deal with only *Rasauṣadhi* group of formulations. Some of the *Āyurvedic* books known as *Nighaṇṭu Granthasa* like *Dhanvantarinighaṇṭu, Kaiyadevanighaṇṭu, Bhāvaprakāśanighaṇṭu, Rājanighaṇṭu,* etc. deal mainly with single drugs, describing their habitat, characteristics and therapeutic action.

Bhaiṣajya Kalpanā aspects mentioned in some of the books enlisted are below :

Caraka Saṁhitā

Acārya caraka contributions to *Bhaiṣajaya Kalpanā* (*Bheṣaja* and *kalpanā*) are mentioned previously apart from those a wide range of pharmaceutical description is available from the *Caraka Saṁhitā.*

The basic processing techniques of *Bhaiṣajya kalpanā* are elaborately explained in this saṁhitā, They are called the *pañcavidha Kaṣāya Kalpanās* viz.

1. Swarasa Kalpanā 2. Kalka Kalpanā 3. Kwātha Kalpanā 4. Hima Kalpanā 5. Phānta Kalpanā.

The processing techniques, dose of the medicine, *Anupāna* (Catalist or vehicle) and mode of administration of the above mentioned *pañcavidha Kaṣāyas* have been elaborated. The total herbal drugs are divided depending upon their pharmacological characters into 50 *Mahapāncavidha Kaṣāyagaṇas* eg : *Jivanyadigana, Bṛmhanīyagaṇa* etc.

Since the *pañcavidha kaṣāya kalpanā* has short duration of expiry period , so that the formulations which can be preserved for long time and can be administered conveniently was mentioned in later part of *Caraka saṁhita* called "Cikitsa Sthāna" They are 1. Cūrṇa Kalpanā, 2. Vaṭī Kalpanā, 3. Ghṛta, Taila Kalpanās 4. Avaleha Kalpanā and 5. Āsava, ariṣṭa kalpanās are mentioned during the explanation of treatment aspects of different diseases and also in *kalpa* and *siddhi sthāna's* there is a lot of formulations which can be utilised in *pañcakarma* e.g.: Vamana Kalpanā, Virecana Kalpanā, Vasti Kalpanā and Naśya Kalpanā etc, are mentioned.

Depending upon the presence of active preinciples in particular part of plant, that part is selectively chosen for the medicinal purposes in the *Sūtrasthāna* itself. Depending upon this , the author has divided the herbs into different groups like *mūlini, phalini* etc.

Dietic aspects of Caraka Saṁhitā

Different types of rice are described in detail.

The following are the ten principles underlying the wholesome diet and its intake (Vimāna 1:24-25).

1. The food should be hot.
2. The food should be unctuous.
3. The food should be taken in proper quantity.
4. The food should be taken only after the previous meal is digested.
5. The food- ingredients should not be contradictory in their potency .
6. The food should be taken in a pleasant place with required accessories.
7. The food should not be taken in excessive hurry.
8. The process of intake should not be exceedingly slow.
9. While eating, one should neither talk nor laugh; during this time one should concentrate on eating only.

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10. Only such food should be taken which is wholesome to the physical constitution and psychic temperament of an individual.

Suśruta-Saṁhitā

As it is known that, Suśruta-saṁhitā is basically related with śalya tantra (surgery), the author susruta has given better information about formulations related with Vraṇaśodhana, Vraṇaropaṇa (wound healing and anti inflammatory), Vidhradhi cikitsa (Abscess treatment) and formulations ment for other surgical (Pre-operative, operative and post operative) complications with their method of preparation, pharmacological characters, mode of administration, regulation of dosage have been explained elaborately.

Basic kalpanās are mentioned as Six varieties in suśrutha saṁhitā as mentioned below:

1. Kṣīra, 2. Rasa (swarasa), 3. Kalka, 4. Śṛta (kwātha) 5. Śīta 6. Phāṇṭa

Suśruta concept regarding drug potency

Suśruta, after closely investigating all the theories on the subject, inclines towards the opinion that it is the potency of the drug that is curative, though he observes that in as much as potency cannot exist independently of a drug, a drug is of primary interest for all practical puroposes in therapy.

Suśruta formulated the process of preparing medicinal oils and ghee, and laid down the use of *śatadhauta ghṛtam* (clarified butter, a hundred times washed with water in succession), *sahasrapāka taila* (medicinal oil, successively cooked a thousand times), *kumbha- ghṛtam* (clarified butter, a hundred years old). It may be fairely said that he was in sight of the principle of drug dynamisation.

It is mentioned in the *Suśruta saṁhitā* is that, the different drugs such as roots, leaves etc. should be collected in the seasons proper to each. *Suśruta* classified soil in to five different kinds for the purpose of growing drugs of different therapeutic properties.

Processes for the preparation of *Kṣāra* (alkalies) and the lixiviation of ashes are very elaborately described. Beyond these the chemical knowledge of suśruta scarcely extends.

It has been lately discovered by a German Physiologist that tubercular bacilli do not thrive in goat's blood. The importance of goat's milk in colitis as an efficient agent in checking ferment in the intestines, or of the close contact of a goat as a powerful auxiliary in curing tuberculous phthisis was first demonstrated by Suśruta.

The fumigation of the sick-room with antiseptic preparations such as Aṣṭanga dhūpa is purely Indian in its origin and in no way inferior to the modern introduction of cogghills respirators.

Different *kalpanā* (forms of medicines) mentioned in *Suśruta saṁhitā* are described below :

1. Akṛtayūṣa rasa 2. Anjanam 3. Anjana varti 4. Aṇutaila 5. Ayaskṛti 6. Avacūrṇa 7. Aveleha 8. Ālepa 9. Ikṣucūṣaṇam 10. Ikṣurasa 11. Utkārikā 12. Utsādanam 13. Upanāha 14. Ulluptamāṁsam 15. Uṣṇāmbu 16. Odanam 17. Kalka 18. Kavala 19. Kaṣāya 20. Kāmbalika 21. Kumbhasarpi 22. Kulmāṣa 23. Kṛtayūṣa rasa 24. Kṛśara 25. Kūrcika 26. Kwātha 27. Kṣārakalpanā 28. Kṣārasūtra 29. Kṣārodaka 30. Kṣīraghṛtam 31. Kṣīrapāka 32. Khaṇḍa 33. Gaṇḍūṣa 34. Guḍa 35. Ghṛtam 36. Ghṛtapāka 37. Ghṛtamaṇḍa 38. Cūrṇa 39. Takra 40. Takrakūrcika 41. Tailapāka 42. Dadhi 43. Dadhimaṇḍa 44. Dhānyāmlakam (kānji) 45. Dhūmavarti 46. Navanīta 47. Nasya 48. Pariśuṣkamāmsam 49. Pānaka 50. Pāyasa 51. Pīyūsa 52. Piṣta 53. Peya 54. Prataptamāṁsam 55. Pradigdhamāṁsam 56. Pradeha 57. Pralepa 58. Bharjitamāṁsam 59. Phāṇta 60. Phanita 61. Majja 62. Maṇḍa 63. Maṇḍura 64. Matsyaṇḍika 65. Sandhāna kalpanā (a) Ariṣṭa (b) Āsava (c) Iksurasasāva (d) Jagala (e) Tuṣāmbu

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(f) Prasanna (g) Bakkasa (h) Madhvāsava (i) Maireya (j) Vāruṇī (k) Śuktam (l) Śidhu (m) Sura (n) Surāsava (o) Sauvīrkam. 66. Madhu 67. Madhumastaka 68. Mantha 69. Mastu 70. Māṁsarasa 71. Modaka 72. Yavāgu 73. Yūṣa 74. Rasakriya 75. Rasāyanam 76. Rasāla 77. Rāgaṣāḍava 78. Lājamaṇḍa 79. Lāja 80. Leha 81. Lohakitta 82. Loharaja 83. Vaṭaka 84. Varti 85. Vasa 86. Vāṭya 87. Vilepi 88. Viṣyandana (Godhūma nirmita) 89. Viśvāra 90. Śarkara 91. Śiṇḍākī 92. Śītarasa 93. Ṣaḍangapānīyam. 94. Ṣaḍava 95. Swarasa 96. Saktu etc.

Bhaiṣajya Kalpanā contributions of Kāśyapa Saṁhitā

Detailed description including definition of *auṣadh, bheṣaja, bhaiṣajya, agada* and *kaṣāya* is given, their seven preparations i.e. *cūrṇa* (powder), *sitakaṣāya (cold infusion), kalka (paste)* and *kwātha (decoction)* are mentioned. The *ahara (diet)* is said to be the greatest mecine and twenty five types of soups are described. Properties of dew-water are also mentioned.

Just passing reference about dosage shedule for children is available in *Suśruta Saṁhitā*, moreover in *Kāśyapa saṁhitā* it is dealt in great details. Few recipes of *Kāsyapa. Samhitā* having been quoted in *Aṣṭāṅga- Hṛdaya.*

In *Kāśyap-saṁhitā* good number of recipes are mentioned. There recipes can be categorised under specific headings like wise.

1. Dhūpa Kalpanā 2. Lehya Kalpanā 3. Ghṛta Kalpanā 4. Taila Kalpanā 5. Ariṣṭa Kalpanā 6. Other Kalpanā

Ariṣṭa Kalpanā : Abhāyariṣṭa, Kuṭajāriṣṭa, Mahābhayāriṣṭa.

Dhūpa Kalpanā

Though fumigations are described by other authors, but the long list of fumigations of *Dhūpa Kalādhyāya* for various purposes other than those mentioned by other authors and also classifications as *pratidhūpa, anudhūpa* etc. are also contributions of *Kāśyapa- saṁhitā.*

Lehya Kalpanā

Certain *lehyas* are prescribed mainly as a substitute or supplementary feed with detail indications and contra- indications. e.g. *Kalyāṇaka leha, Kalyāṇakā-rasakriya, Kaṭukavindu avaleha*, etc. *Āgneyadhūpa, Ariṣṭa dhūpa, Bhadraṅkara dhūpa, Brāhma dhūpa, caturāṅgika dhūpa, Daśāṅga dhūpa, Gaṇadhūpa, Grāmadhūpa, Gṛha dhūpa, Grahaghnadhūpa, Kaṇadhūpa., Kaumāradhūpa, Māheśvara dhūpa, Moha dhūpa, Nandakadhūpa, Puṇya dhūpa, Rakṣoghna dhūpa, Śiśuka dhūpa, Śrīdhūpa, Swastikadhūpa, Uttama dhūpa, Vāruṇadhūpa.*

Other Kalpanās mentioned in Kāsyapa saṁhitā : Abhaya guda, Agastyaharītakī, Cakṣuṣyāraskriyā, Cāturbhadra Kalpa, Eraṇḍa Vasti, Guḍaharitakī, Kautukāñjana, Kokilā guḍika, Laśuna kalpa, Lohitikā guṭikā, Nārācaka cūrṇa, Phalavarti, Puṣpaka kalpa, Śatapuṣpā-Kalpa, Śatāvari kalpa, Traivṛtayoga, Trisamā guṭikā, Trivṛtāṣṭaka cūrṇa, Vardhamāna pippali etc.

Ghṛta Kalpanā

Abhaya ghṛta, Amṛta ghṛta, Brāhmī ghṛta, Candanādya ghṛta, Daśamūlādi sarpi, Daśārṅga ghṛta, Drākṣā ghṛta, Gandhasarpi, Indrāṇī ghṛta, Kalyāṇaka ghṛta sarpi, Kautuka sarpi, Kaumbha sarpi, Mahākalyāṇaka sarpi, Mahānta sarpi, Maṅgalyaka ghṛta, Pañcagavya ghṛta, Paṭolādya ghṛta, Pīlu ghṛta, Punarnavā ghṛta, Śaiśuka ghṛta, Samvardhana ghṛta, Śatadhaula/Sahasradhauta ghṛta, Ṣaṭpala ghṛta. Tikta ghṛta/sarpi, Tittirādya ghṛta, Viḍanaga ghṛta etc.

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Taila Kalpanā

Anantā taila, Ātitaila, Bādara taila Bālākā taila, Balā taila, Drāksa taila, Gandharva taila, Guḍūci taila, Hamsa taila, Kapittha taila, Karṇi kāra taila, Krauñca taila, Kumāra taila, Lakṣādi taila, Madhuka taila, Minga taila, Nāgavīryā taila, Pāncabhautika taila, Phala taila, Pilutaila, Punarnavā taila, Rāja taila, Rāsnā taila, Sahacara taila, Sārasa taila, Śatapuṣpā taila, Śatāvarī taila, Syonāka taila, Valgu taila, Vṛṣa taila, Yaṣṭīmadhuka taila, etc.

Harita Saṁhitā

In this book the *Kwātha (decoction)* has been explained elaborately with different varieties depending upon their pharmaceutical and pharmacological aspects. In this book we get the description about other fornulations too.

Saṅgraha Kāla

The *Saṅgraha Kala* includes the time period of *Aṣṭāṅga Saṅgraha* and *Aṣṭāṅga Hṛdaya* too. During this time, most of the information given by *Ācārya Caraka, susruta* and *Kāśyapa* were followed with mild changes. During this time the effect of God Buddha was so much.So consequently there was a depelopment of *Bhaiṣajya kalpanā* which is interlinked with *Rasaśāstra.*

This period viz, between 8th centruy to 13th century may be considered as the *Golden Era* of *Rasaśāstra* . During this period a number of *Rasaśāstra* formulations were invented and *Ācārya Nāgārjuna* wrote very important books related to *Rasaśāstra* and *Bhaiṣajya Kalpanā* too. Even though *Rasauṣadhies* has developed repidly during this era, it also includes most of the information related with *Bhaiṣajya kalpanā* (Hence *Rasaśāstra* and *Bhaiṣajuya kalpanā* can be considered as interlinked subjects.) Most of the herbs are also used during the pharmaceutical process of *Rasauṣadhies*. Hence this period can also be considered as an important time for *Bhaiṣajya Kalpanā.*

Ādhunika Kāla

During this period due to political imbalance, the development of *Bhaiṣajya kalpanā* also effected. But during this period, some new formulations like *Sarabhath, Gulkaṇda, Pānaka, Malahar* and other *kalpanās* were introduced into *Bhaiṣajya kalpanā*. During the British rule, antibiotics and other allopathic formulations became popular in India. This too caused a setback to *Āyurvedic medicines*. However, due to establishment of *Āyurvedic Pharmacies*, new formulations and new packing techniques helped *Āyuredic Pharmaceutics*. Largely, many manchineries like pulvarizors, tablet-compressing machines etc. were introduced. Due to which, the time required for the preparation of *Āyurvedic medicine* saved and large scale production of the medicines became possible. Thus, large quantities of medicnes could be produced in shorter duration and with a systematic and scientific packing methods.

Śārangadhara saṁhitā

This book was written in the 14th century by *Shri Ācārya Śārṅgadhara*. It is considered as an authentic book for this subject, because :

1. Clear definitions of Pharmacological terms are found in the text and also the method of preparation of all types of recipes are stated explicitly.
2. Recipes found herein are simple, easy to prepare and effective, which make the practice easy, therefore , this book is considered as the hand book for an *Āyurvedic Physician.*
3. Opium and some other new drugs were incoporated into *Āyurvedic materia medica* through this treatise.

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4. A new technique mentioned in this book is introducing of drug directly into the bolld stream through and artificial wound *(Sūcikābharaṇa rasa Prayoga)*. This can be considered as an example for parenteral administration of medicine in *Āyurveda*.

It is a considerable therapeutic and historical interest is the inclusion of the *sūcikabharaṇaras* derived from *Rasendracintāmaṇi*, in his *saṁhitā* by *Śārṅgadhara*. From the point of view of therapeutics, the dosage of *Sūcikābharaṇarasa* and the mode of its administration are of significance. An exstremely, minute quantity of this drug, equal to that which can be taken up by the sharp point of a fine needle, is to be rubbed by the finger into the subcutaneous tissue exposed by an incision by a sharp knife in the skin of the scalp in such extremely desperate conditions as coma due to high toximia, syncope and cobra bites with grave prognosis, on which latter condition, in special it is claimed to save the patient from and otherwise fatal termination. Explaining the mode of the action of this drug, says *Śarṅgadhara*, "Administered in the manner described, this drug comes in direct contact with blood and it is then taken up directly by the latter and it thus acts immediately. If the patient's temperature shoots up, he is to be given sweet substances : It would appear that the parentral administration of life saving drugs was presented in his *saṁhitā* only such formulations., both organic and inorganic-as are of proven value and utility, the *Sūcikabharaṇarasa* must gave passed through extensive clinical trails and employed by physicians of not only the contemporary period but also of subsequent periods.

Historically speaking, the credit of the discovery of the parenteral method of the administration of life saving drugs goes possibly to India in the medieval period, and its introduction to the practice of medicine, to *Śārṅgadhara*. He may justifiably be classed anong the pioneers who richly contributed to the subject which was slowly building up since the IX century A.D. and which reached its climax by about the XIII century A.D. Justifiably too is the inclusion of the *Sārṅgadharasaṁhitā* as the number two of the three later medical classics which as seen elsewhere, were known together as the *Laghutrayi*, His contributions may be said to have laid the foundation for the developments which took place from the XIII century to the XVIII.

Cakra Datta (Cakra Pāni 11th A.D.)

Many number of *kwātha yogas* are mentioned. Apart from this *kalka, cūrna, ghṛta, taila, ariṣta, guḍa, guṭika, modaka, māṁsarasa, lepa* etc., *yogas* are very widely mentioned with their clinical use.

Cakradatta stood as the first representative work of the medievalera which was also accepted as a *handbook* of *medicine* in the *Āyurvedic profession* and continued to be so for centuries to follow. *Cakradatta* prescribed *Rasauṣadhis* for treatment of various disorders. About *Rasaparpatī*, it is said that it is described (first) by *Cakrapani*, Similarly, use of iron and other minerals are seen in advanced form. A large number of formulations contain these mainerals. There are also some new therapeutic measures and formulations prescribed for treatment of certain disorders.

Gadanigraha

In this book, on the basis of *kalpanās*, the chapter names are mentioned e.g. *tailādhikar, ghṛtādikar, cūrṇādhikar* etc., this shows that, prime importance is given in this book for *kalpanās*.

Bheṣaja Kalpah

As the name suggests is a work on the *Bhaiṣajya kalpanā*. In the colophon of the work it is stated thus ends *Bheṣaja Kalpah*, the seventh chapter in *Āyurveda Sudhānidhi* (Amfrocial Ocean of Āyurveda). This suggests that, the author had writen a large work *Āyurdveda sudhānidhi* of which this portion consisting of 525 verse formed the seventh chapter.

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The authorship of this work is attributed to one *Bhagawān Bharadwāja*. The views of later authors like *Bhoja, Ravigupta* etc. also sum of the drugs that are peculiar to South India like *Kuppameni*, *Pei Meratti* etc. are mentioned in this work. It may be inferred that the author might have lived in between 12th and 15th centuries and belonged to *Bharadwāja Gotra* and to South India.

Though the subject matter *Bhaiṣajya Kalpanā* is also available in other printed *Āyurvedic* books, it is in a scattered form. In this work all the information is collected as one place, codified and aranged in a systematic way, being spelled over under suitable relevant headings. Thus this work deals with all the relevant and important aspects of *Bhaiṣajya Kalpanā*, as the part of the drugs to be used the appropriate season and place of their collection, substitutes of unavailable drugs selection of drugs, pharmaceutical processing with their technicalities, weights measures etc.

During this period *(ādhunika kāla)*, *Bṛhad yoga taraṅgiṇi, Yogaratnākara, Āyurveda sāra saṅgraha, rasatantrasāra, siddhabheṣajamaṇimāla, siddhayogasaṅgraha* etc. *Rasaśāstra* books are came into light. All most all of these books are given the information about *Kwātha, Cūrna , Āsava, Ariṣṭa, ghṛta, taila, loha* etc. *Kalpanās* too. Particularly in *Bṛhadyoga taraṅgini, Āyurvedasāra saṅgraha, Bhāva prakāśa* etc. books, mentioned about processing of different yogas (Related to *Bhaiṣajya Kalpanā*) are mentioned more systematically.

Bhārata Bhaiṣajya Ratnākara

This is one of the useful work of *Bhaiṣajya kalpanā* and *Rasaśāstra* during *Ādhunika kāla*. It is written in five parts.

Apart from these some more works, particularly concentrating the *Paribhāṣa* of *Bhaiṣajya kalpanā* are written during this period. They are likewise:

Āyurvediya Paribhāṣa	:	Gaṅgadhar
Vaidyaka Paribhāṣa Pradīpa	:	Govindasena
Paribhāṣa Prabandh	:	Jagannāth Śukla
Navaparibhāṣa	:	Upendranāth Das

Only on concentrating the *Bhaiṣajya Kalpanā* some of the books are published recently, They are likewise:

Abhinava Bhaiṣajya Kalpanā Vijñān	:	*Ācārya Siddinandanamisra*
Bhaiṣajya Kalpanā Vijñan	:	*Avadhabihāri Agnihotri*
Bhaiṣajya Saṁhitā	:	*Atridev Gupta*
Bhāratīya Bhaiṣajya Kalpanā vijñana	:	*Ācarya Viswanatha Dwivedhi*
Rasa Bhaiṣajya Kalpanā vijñanam		
Volume II Bhaiṣajya Kalpanā	:	*Vaidya Santosh Kumar Sharma Khandal*

The Āyurvedic Formulary of India –Part – I First edition

Every attempt has been made to include in it as many important formulations as are currently manufactured on a large scale in terms of value and in use throughout the country. Various organisations, institutions including pharmacy and individual *Vaidyas*, in different regions were consulted before the formulary was prepared. The formulary, therefore, represents the concensus of opinion from *Āyurvedic* profession as a whole and committee urges the Central Government to recommend the adoption of this formulary by all *Āyurvedic* institutions maintained by Governments in the States, as well as semi- Government and other institutions managed by publicVoluntary organisations.

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Āyurvedic formulary of India gives information about following *Kalpanas* namely: *Āsava, ariṣṭa, arka, avaleha, pāka, kwātha cūrṇa , guggulu , ghṛta, cūrṇa , taila , drāvaka, lavaṇa , kṣāra, lepa, vaṭī, guṭikā, varti, netrabindu, anjana, sattva, kūpipakva rasāyana, parpati, piṣṭi, bhasma, maṇḍūra, rasayoga, lauha.*

Pharmacopoeial Standards for Ayurvedic formulations

It is published by C.C.R.A.S., New Delhi the revised edition of the book consists the following :

1. Monograph; 431 formulations divided under 21 categories, each category and the formulation in it, arranged in alphabetical order as per the name written in Roman letters.
2. Appendix-I : Details regarding definition, general method of preparation, characteristics, preservation and storage of each category of formulations are given.
3. Appendix-II: A small note on (a) guidelines to be followed in the use of the standards and (b) General Principles to be followed in prescribing the standards are given.
4. Appendix-III: The methods of preparations of all analytical reagents and indications for volumetric, gravimetric and other types of determination tests and also the detailed description of the tests are given.
5. Appendix IV: It is divided into 3 categories

(A) List of single drugs of animal origin with *Śānskrit name* and common English name.
(B) List of single drugs of mineral origin with *Śānskrit name* and common English name.
(C) List of single drugs of plant origin with *Śānskrit name* and their respective botanical names with substitutes, if any. This revised edition of the book would safeguard and strengthen the interests of the manufacturer of ethical *Ayurvedic Products*, the Physicians and the consumer with qualitative best *Āyurvedic formulations*.

The drugs and cosmetics act 1940

It is a Govt. publication and it gives all the information about rules and regulations related with *Āyurvedic* drug manufacturing and its usage.

Thus, An *Āyurvedic* medicine as defined in the Drugs and cosmetics Act 1940 includes all medicines intended for internal or external use, for the diagnosis, treatment , mitigation or prevention of disease of disorder in human being or animals and manufactured exclusively in accordance with the formuladescribed in the authoritative books of *Āyurvedic system* of medicine specified in the first schedule of the act.

Indian meteria media

Dr. K.M. Nadakarni (1908)

The pharmacopeia of India

Dr. Kartik chandra Bose (1932) and several others in Indian languages. The *Āyurvedic* pharmacopeia committee in the ministry of health and family welfare have therefore, given priority to the compilation of a National Formulary of 450 compound formulatios which are manufactured and sold on alarge scale by the *Āyurvedic pharmaceutical* Industry and are also used by practitioners of this system. Efforts have successfully been made to establish the botanical identity of the plant drugs. Control over the manufacture and sale of *Āyurvedic* medicines is also exercised through the drugs and cosmetics Act.

A number of State Governments have set up pharmacies in the public sector for the manufacture of

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Āyurvedic Medicines to meet the requirements of the medical relief, Institutions of *Āyurveda* maintained by them. To make available potent drugs of *Āyurveda* and other systems of medicine, a central pharmacy is to be established by the Central Governments. In addition, the Central Government provides financial assistance to the pharmacies maintained by the state Governments in order to increase the production capacity of genuine drugs, to meet the requirements not only of their medical relief institutions by also of the public at large.

There are at present many pharmacies engaged in the manufacture of drugs of *Āyurveda* in the country. Export of *Āyurvedic* drugs is confined not only to South East and Middle east countries but, also to Europe and America.

Central council for research in Indian medicine and Homoeopathy (*Āyurveda*, Siddha, Unani, Homoeopathy and Yoga) come in to being in the year 1969. The council is engaged in research programmes in different fields, givineg priority to those areas, as like evolving of stadards for drugs and pharmaceutical preparations used in Indian Medicine.

Āyurvedic medicines are mostly manufactured according to the formulae and processes mentioned in the classical texts. With the advances in science and technology a continuous search is on for new drugs combat unknown and new diseases and the action of a drug on conditions other than those known or unknown or described in texts. Thus, a large number of patent drugs have come up in the country. These time tested *Āyurvedic* drugs have proved popular not only because of their easy availablility, but are prefered for the treatment of iaetrogenic diseases.

History of Modern Pharmacology

The earliest sources of Western medicine came from Egypt and the two kingdoms of Assyria and Babylonia and Greek physicians like Hippocrates. Later these were developed very widely through out the world. Then this special branch was named as pharmacology, Since Pharmacologybecame very elaborate, it was divided into different subfaculties. Pharmacology is the science that deals with drugs. The word is derived from Greek Words Pharmacon (an active principle) and logos (a discourse or treatise).

Definition of Drug

The word 'drug' is derived from the French word 'drogue', "a dry herb" a drug is defined as any substance used for the purpose of diagnosis , prevention relief or cure of a disease in man or animals According to W.H.O. "A drug is any substance or product that is used or intended to be used to modity or explore physiological systems or pathological states for the benefit of the recipient".

Pharmacology consists of detailed sudy of drugs, particularly their actions on living animals, organs or tissues. The actions may be beneficial or harmful. It includes such allied fields as Pharmacognosy, Pharmacy, Pharmacodynamics, Therapeutics, toxicology and Chemotherapy.

1. Pharmacognosy which is the science of indentification of drugs.
2. Pharmacy which is the science of indentification, selection, preservatiom, standardisation, compounding and dispensing of medicinal substances.
3. Pharmacodynamics is the quantitative study of the biological and therapeutic effects of drugs. Such studies also elucidate the mechanism of the action of a drug and may correlate the drug actions with their chemical structure. the term Pharmacokinetics is used to describe the study of the absorption, distribution, metabolism and excretion of drugs and their relationship to Pharmacologic response.

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4. Therapeutics means to care for or to nurse. It is a branch of medicine concerned with the cure of disease or relief of symptoms and includes drug treatment.
5. Toxicology is the science of poisons. Poisons are substances that cause harmful, dangerous or fatal symptoms in animals and human beings, many drugs in larger doses act as poison. Treatment of poisoning are included in this branch.
6. Chemotherapy is concerned with the effect of drugs upon micro-organisms and living parsites which multiplying in a living organism.

Materia medica is the older term for branch of pharmacology concerned with sources, description and preparation of drugs. Pharmacopoeia is an official code containing a selected list of the established drugs and medicinal preparations with descriptions of their physical properties and tests for their identity, Purity and potency, Pharmacopoeia defines the standards which these prepartions must meet and their average doses for an adult. A few well- known pharmacopoeias are the Indian Pharmacopoeia (I.P.) the British Pharmacopoeia (B.P.), the United states pharmacopoeia (U.S. P.) and the European Pharmacopoeia(E.P.).

National Formulary is published by the American Pharmaceutical Association. British National Formulary(B.N.F.) is published by the British Medical Association and the Pharmaceutical Society of Great Britain. They include formulae for pharmaceutical Preparations such as elixirs, solutions, tinctures and powders "whose use or efectiveness is reasonably certain. "National Formulary (N.F.) of India is published by the Government of India. British Pharmaceutical codex is published by the Pharmaceutical Society of Great Britain. It gives information on drugs, other pharmaceutical substances and formulated products.

AMA Drug Evaluations

This is a pubication of the American medical association (AMA) Council on Drugs. " The purpose of this volume is to provide the medical profession with evaluation of selected drugs based on the available evidence. An evaluation may be favourable, unfavourable or a combination of both and it only represents a statement of the general merits of the preparation, not its specific usefulness in a given patient."

An attempt in the science and art of pharmacy is continuously being made to provide the drug in the best suited form to a "diseased' person to put him at ease on all accounts. The varied dosage froms different formulations and number of routes of administration are the outcome of achieving the above set goal.

Any form in which a drug is administered in a prescribed quantity is referred as a dosage form of drugs although in case of preparations for external use, the dose is not prescribed.

A pharmacist has to make lot of considerations before giving a form to the drug. Important ones being its stability, acceptibility, bioavailability, biotransformation, its physical and chemical nature, dissolution, disintegration availability, onset of action, duration of action, absorption, degradation and excretion, He has to meet on the requirements of a physician look to the patients convenience and the acceptability of the product by the consumer. Efficacy of the product be also assure from the date of manufacture till it is consumed.

The different dosage forms of the drugs may be broadly classified as under on the basis of their physical nature. These categories include both external and internal use preparations having been for-

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mulated with the help of best suited adjuvants (pharmaceutical aids), many a time depending on the individual requirements of the product.

A broad based classification of dosage forms may be as under :

Dosage Forms

Liquids	Solids	Semisolids
Mixtures	Implants	Pessaries
Lotions	Powders	Ear-cones
Liniments	Capsules	Nasal- bogies
Emulsions	Tablets	Creams
Suspensions	Granules	Ointments
Parenterals	Pills	Pastes
Eye drops	Cachets	Suppositories
Ear drops	Dusting powders	Gellies
Nasal drops	Snuff	Plasters
Mouth wash	Tooth powders	
Gargles		
Parenterals		
Elixers		

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Chapter 2

PARIBHĀṢA

(Glossary of the Technical Terms)

कथ्यते सोमदेवेन मुग्धवैद्यप्रबुद्धये । परिभाषा रसेन्द्रस्य शास्त्रैः सिद्धैश्च भाषिता ।।र.र.स. ८/१

For the benefit of the less intelligent physicians, the *Paribhāṣa* (technical terminology) of *Rasaśāstra*, which is accepted by the scholars and expounded in scriptures, has been described here by *Śrī Somadeva*.

A statement of the exact meaning of a word or phrase etc. is known as definition or *Paribhāṣa*. The words, which are cryptic and ambiguous, are better understood with the help of *Paribhāṣa*. *Rasa Vāgbhaṭṭa* advocates to read and understand the *Paribhāṣa* rendered by *Somadeva* to avoid errors while carrying out mercurial procedures. The study of *Paribhāṣa* engenders of better comprehension about the science of *Pārada*.

अव्यक्तानुक्तलेशोक्तसन्दिग्धार्थप्रकाशिकाः । परिभाषा प्रकथ्यन्ते दीपीभूताः सुनिश्चिताः ।। (वै. परि. प्र.)

निगूढानुक्तलेशोक्तसन्दिग्धार्थप्रदीपिका । सुनिश्चितार्था विबुधैः परिभाषा निगद्यते ।। (रसतरं. २.२)

In *Bhaiṣajya kalpanā* and *Rasa śāstra*, certain technical terms are often used. Explanation of these terms is called *paribhāṣa*. Those interested in the details of *Rasa śāstra* and *Bhaiṣajya kalpanā* should be acquainted with the exact meaning of these technical terms. Some of which related to *Rasa śāstra* and *Bhaiṣajya kalpanā* are described here under.

रसनिगममहाब्धेः सोमदेवः समन्तात् । स्फुटतर परिभाषा नामरत्नानि हृत्वा ।
व्यरचयदतियत्नात्तैरिमां कंठमाला । कलयतु भिषग्र्यो मण्डनार्थे सभायाम् ।। र.र.स. ८/९८

Somadeva, the scholar in *Rasaśāstra* has picked up, with much efforts, the jewels from the ocean of the *Rasaśāstra*, the jewels called *Paribhāsa* which are very valuable and explicit and he has prepared a necklace out of them. In order to attain the respect and superiority in the congregation of *Rasasiddhas*, a physician practicing *Rasavidya* should always wear this necklace.

भवेत्पठितवारोऽयमध्यायो रसवादिना । रसकर्माणि कुर्वाणो न स मुह्यति कुत्रचित् ।। र.र.स. ८/९९

The physician, who is practicing the mercurial medicine, must repeatedly read this chapter and learn it by heart. This certainly helps in avoiding any mistakes possibly occur during mercurial operations.

Dhanvantari Bhāga (Share of the Physician)

अर्धे सिद्धरसस्य तैलघृतयोर्लेहस्य भागोऽष्टमः । संसिद्धाखिललोहचूर्णवटकादीनां तथा सप्तमः ।
योदीयेत भिषग्वराय गदिभिर्निर्दिश्य धन्वन्तरीम् । सर्वाऽऽरोग्यसुखाप्तये निगदितो भागः स धन्वंतरेः ।।
र.र.स. ८/२

If a physician is employed to supervise the preparation of a recipe in the house of a private individual, then in exchange of his free labour he is entitled to a share of the medicine (The patient, with intention of attaining the health and happiness should contribute the physician, who has prepared the medicines for the patient). This varies according to the nature of the recipe as follows :

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Sl. No.	Nature of Preparation	Supervising Physician's Share
1.	*Rasauṣadhies, ghṛta, taila;* preparations	1/2
2.	*Bhasma* of metals, minerals, gems and jewels, *cūrṇa, Vaṭaka*	1/7th
3.	*Avalehya*	1/8th

This share of the physician is called *Dhanvantari bhāga*. If the physician aspires or actually takes more than his share, it is considered unethical or a professional misconduct.

Rudra bhāga

भैषज्यक्रीणितद्रव्यभागोऽप्येकादशो हि यः । वणिभ्यो गृह्यते वैद्यै रूद्रभागः स उच्यते ।। र.र.स. ८/३

प्रगृह्याऽधिकरुद्रांशं योऽसमीचीनमौषधम् । दापयेल्लुब्धधीर्वैद्यः स स्याद्विश्वासघातकः ।। र.र.स. ८/४

Rudra bhāga is that which is taken by the physicians from the traders or shopekeepers as their commission. This is 1/11th part of the cost of the medicine which a shopekeeper gets from the purchaser.

Rasapanka

सद्रवा मर्दिता सैव रसपंक इति स्मृतः ।। र.र.स. ८/६

सद्रवैर्गन्धकाद्यैश्च धातुभिः पेषितो रसः। सुश्लक्ष्ण पङ्कसङ्काशो रसपङ्क इति स्मृतः।। र.त. २/२९

Rasapanka is the substance obtained by pounding *pārada* with *gandhaka* and other substances mixed with liquids like *swarasa*, *kwātha* etc. *Rasapanka* is otherwise considered as *Kajjali* pounded with liquid.

Rasapanka is the resultant soft material which is produced by rubbing the above said metals and *gandhaka* etc. with parada along with an liquid substances.

Rasapiṣṭi

अर्काशतुल्याद्रसतोऽथगन्धा न्निष्कार्धतुल्यात्कुटितोऽभिखल्ले ।

अर्कातपे तीव्रतरे विमर्द्या पिष्टी भवेत्सा नवनीतरूपा ।। र.र.स. ८/७

1/2 *Niṣka* (12 ratti-1.5 gms) of *gandhaka*, and its 12 times (144 ratti-18 gms) *Pārada* (some opine it as 1/12 part) are taken in the *Khalva* and triturated will under extremely hot sunrays. The resulting butter like substances is called *Rasapiṣṭi*.

Piṣṭi

खल्ले विमर्द्य गन्धेन दुग्धेन सह पारदम । पेषणात्पिष्टतां याति सा पिष्टीति मता परैः ।। र.र.स. ८/८

Pārada and *Gandhaka* are taken in an equal quanitity and grind vigorously in a *Khalva* along with (cow's) milk. The floor like substance which is produced is called *Piṣṭi*.

Pātana Piṣṭi

चतुर्थांशसुवर्णेन रसेन कृतपिष्टिका । भवेत्पातनपिष्टी सा रसस्योत्तमसिद्धिदा ।। र.र.स. ८/९

The *Piṣṭi* which is prepared by grinding *Pārada* and 1/4 of gold is called *Pātana Piṣṭi*. It is beneficial in the achievement of *Rasasiddhi*.

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Swarṇa Roupya Kṛṣṭi

रूप्यं वा जातरूपं रसगंधादिभिर्हतम् । समुत्थितंच बहुशः सा कृष्टि हेमतारयोः ।। र.र.स. ८/१०

With the help of *Pārada* and *Gandhaka, bhasma* of *swarṇa*, *Rajatha* are prepared and from these *bhasmas* once again the *Swarṇa* or *Rajatha* (metals) are reobtained by *utthapana*. Such *Swarṇa* is called *Swarṇa Kṛṣṭi*, and *Rajata* is called *Roupya Kṛṣṭi*.

Characteristics of best Kṛṣṭi

कृष्टी क्षिपेत् सविर्णातिर्नवर्णो हीयते तया । स्वर्णकृष्ट्या कृतं बीजं रसस्य परिरंजनम् ।। र.र.स. ८/११

If the superior kind of *Kṛṣṭi* is mixed with pure *Swarṇa*, no change of colour is seen in it. The *Bīja* which is prepared with such an excellent *Kṛṣṭi* can perform *Ranjana Karma* of *Pārada* properly.

Bhāvana

यच्चूर्णितस्य धात्वादेर्द्रवैः सम्पेष्य शोषणम्। भावनं तन्मतं विज्ञैर्भावना च निगद्यते।। र.त. २/४९

द्रवेण यावता द्रव्यं चूर्णितं त्वार्द्रतां व्रजेत्। तावानेव द्रवो देयो भिषग्भिर्भावनाविधो।। र.त. २/५०

The procedure of steeping the powders of *dhātus* and herbs with liquid substances like *swarasa*, *kwātha*, *taila*, *ghṛta* etc. followed by trituration in *Khalvayantra* to dryness is known as *Bhāvana*. If *kwātha* is employed for *bhāvana* process it should always be *aṣṭamāṁśa-avaśeṣita kaṣāya* (reduced to 1/8th part). The quantity of *Kaṣāya dravya* must be equal to the quantity of the substance to be triturated and eight times quantity of water is added in the *kwātha* preparation. Here the heat produced during grinding and the atmospheric heat helps in drying the materials quickly. By applying *bhāvanā* the drugs are rendered fine and potentiated.

Āvāpa

द्रव्यान्तरविनिक्षेपो द्रुते वङ्गादिके तु यः। क्रियते स प्रतीवाप आवापश्च निगद्यते।। र.त. २/३९

Adding any other metal or other substances to the melted metal is known as *Āvāpa*. *Prativāpa* and *Āchhādana* are the synonyms of *Āvāpa*.

Nirvāpa

धात्वादेर्वह्नितप्तस्य जलादौ यन्निषेचनम्। स निर्वापः स्मृतश्चापि निषेकः स्नपनश्च तत्।। र.त. २/४०

Heating the metallic substances till red hot and put them into the water or any other liquid is known as *Nirvāpa*. *Nirvāpa* is also called as *Niṣeka* and *Swapana*.

Varaloha

ताम्रं तीक्ष्णसमायुक्तं द्रुतं नक्षिप्य भूरिशः । सुगंधलकुचद्रावे निर्गतं वरलोहकम् ।। र.र.स. ८/१२

The equal quantities of *Tamra* and *Tīkṣnaloha* are melted and poured in the juice of *Lakucha* and added with *Gandhaka*. This process is repeated for several times. The resultant substances (an alloy) is named as *Varaloha*.

Hemarakti

तेन रक्तीकृतं स्वर्णं हेमरक्तीत्युदाहृतम् ।। र.र.स. ८/१३

When this *Varaloha* is mixed with gold, it turns in to red. Such a *Swarṇa* is called *Hemarakti*.

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निक्षिप्ता सा दृते स्वर्णे स्वर्णोत्कर्ष विधायिनी । तारस्य रंजनी चपि बीजराग विधायिनी ।। र.र.स. ८/१४

The *Hemarakti* is, when added to liquified *swarṇa*, gains much more beautiful colour. This *Hemarakti* can be able to colour the Roupya. As it is *Bīja roopa*, it can impart the best colours, even to other metals.

Tārarakti

एवमेव प्रकर्तव्या तारक्ती मनोहरा । रंजनि खलु रूप्यस्य बीजानामपि रंजनि ।। र.र.स. ८/१५

The *Tārarakti* is prepared as mentioned in *Hemarakti*, by adding *Varaloha* in melted *Roupya*. It colours, not only the *Roupya* but also the *bīja*.

Candradala, Analadala

मृतेन वा बद्धरसेन वाऽन्य ल्लोहेन वा साधितमन्यलोहम् ।
सितं च पीतत्वमुपागतं त द्दलं हि चंद्रानलयोः प्रसिद्धम् ।। र.र.स. ८/१६

If, any metal is converted into white colour, with the help of either *Mṛta pārada* or *Baddha Pārada* or any other metal, it is called *Candradala*. On the other hand, if the metal changes to yellow colour it is called *Analadala*.

आभासकृतबद्धेन रसेन सह योजितम् । साधितं वाऽन्यलोहेन सितं पीतं च तद्दलम् ।। र.र.स. ८/१७

With the help of the *Pārada*, which has undergone the *Abhāsa Samskāra*, or with the help of any other metals, if a metal changes into white, it is known as *Sitadala* or *Candradala*. However if it converts into yellow colour, it is called *Pītadala* or *Analadala*.

Śulbanāga

मक्षिकेण हतं ताम्रं दशवारं समुत्थितम् । तद्वद्विशुद्धनागं हि द्वितयं तच्चतुष्पलम् ।।
नीलांजनहतं भूयः सप्तवारं समुत्थितम् । इति संसिद्धमेतद्धि शुल्बनागं प्रकीर्त्यते ।।

र.र.स. ८/१८-१९

The *bhasma* of *Tāmra* is prepared by using *Swarṇamākṣika*, and from this *bhasma*, the metallic *Tāmra* is re-obtained, by *utthāpana*. In this way the *bhasma* is prepared for 10 times and each time the metallic *Tāmra* is re-obtained. Similarly *Nāga bhasma* is prepared with the help of *Swarṇamākṣika* and *Nāga* is re-obtained from the *bhasma*. This process too is repeated for 10 times and *Nāga* is re-obtained in its metallic form. Such *Tāmra* an *Nāga* taken 2 *Pala* (8 *Tola*) each and the *bhasma* is prepared by using *Nīlāñjana*. Such *bhasma* is processed again to obtain the combined metals of *Nāga* and *Vanga*, for 7 times. Such an alloy is called *Śulba Nāga*.

Properties of Śulba Nāga

साधितस्तेन सूतेन्द्रो वदने विधृतो नृणाम् । निहान्ति मासमात्रेण मेहव्यूहमशेषतः ।।
पथ्याशनस्य वर्षेण पलितं वलिभिः सह । गृध्रदृष्टिर्लसत्पुष्टिः सर्वारोग्यसमन्वितः ।।

र.र.स. ८/२०-२१

A spherical ball (small) prepared with the help of *Pārada* which is processed by the above *Śulba Nāga*, if kept in the mouth, can cure all types of *Pramehas* within a month. If such a ball is kept inside the mouth for one year and follow all the diet restrictions the *valipalita* (wrinkling of the skin and graying of hair) roga is eradicated. At the same time the vision becomes very sharp like that of eagle. Also the body becomes strong, the complexion bright and the complete health is achieved.

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Pinjari

लोहं लोहान्तरे क्षिप्तं ध्मातं निर्वापितं द्रवे । पांडुपीतप्रभं जातं पिंजरीत्यभिधीयते ।। र.र.स. ८/२२

A metal is melted and mixed with another melted metal and this mixture is poured in any other liquid. By this, if the alloy turns whitish yellow, then it is called *Pinjari*.

Candrarka

भागाः षोडश तारस्य तथा द्वादश भास्वतः । एकत्रावर्तितास्तेन चन्द्रार्कमिति कथ्यते ।। र.र.स. ८/२३

Candrarka is an alloy which is prepared by mixing the 16 parts of melted *roupya* in 12 parts of melted *Tāmra*.

Nirvāpana

साध्यलोहेऽन्यलोहंचेत्प्रक्षिप्तं वंकनालतः । निर्वापणं तु तत्प्रोक्तं वैद्यैर्निर्वापणं तथा ।। र.र.स. ८/२४

Nirvāpana is the process in which, another metal is combined with *Sadhyaloha* (the metal which is to be processed), by blowing fire with the help of the *Vankanala* (a bent pipe through which air is blown by mouth, which can enable the intensive fire at a particular restricted area).

Quantum of Nirvāpana

क्षपेन्निर्वापणं द्रव्यं निर्वाह्यो समभागिकम् । आवाह्यो वापनीये च भागे दिष्टे च दिष्टवत् ।। र.र.स. ८/२५

The quantities of the *Nirvāpya dhātu* (the metal in which other metal is added) and the *Nirvāpana dhātu* (the one which is added to the one above) should be equal; or the *Upanīya dhātu* (the metal which is to be added later) and *Avāpya* or *Avāhya* (the metal in which another metal is added) *dhātu* should be equal in their quantum. But where ever no quantity has been mentioned, then, the quantum is decided (or varied) according to ones own experience.

Śodhana

उद्दिष्टै रौषधैः सार्द्धं क्रियते पेषणादिकम्। मलविच्छितये यत्तु शोधनं तदिहोच्यते।। र.त. २/५२

Śodhana is a process in which different drugs are treated with various *peṣaṇādi* (Grinding etc.) procedures after mixing them with other drugs mentioned for the purpose with a view to removing their *malas* (Toxins).

Sāmānya Śodhana : Sāmānya Śodhana is that which may commonly be used for a group of drugs to remove their impurities.

Viseṣa Śodhana : Viseṣa Śodhana is that which is done specifically for particular drugs with a view to purify them further by using specific drugs. This may be considered as specific for the particular drug.

Pharmacological action of different *drava* used in *Śodhana* :

(1) *Āmla drava dravyas* also able to remove the foreign material which is having alkaline in nature.

(2) At the same time *kṣāriya drava dravya* (liquids) will be able to remove the foreign material which is acidic in nature.

Śodhana dravadravya's also will produce the brittleness in material, this change is mostly required for easy and proper *bhasmikaraṇa* of material. The process of eliminating the impurities (*malas*) of the metallic substances by means of *śwedana, mardana, prakṣālana, gālana, avāpa, nirvāpa, bhavana, bharjana* etc. is known as *Śodhana*. Purification (*śodhana* is essential for all the metallic

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substances, not only to eliminate the physical and chemical defects but also to enhance the qualities of those particular substances. For e.g. *Pārada* is having the following defects :

(a) *Naisargika doṣa.*

(b) *Yougika doṣa.*

(c) *Oupādika doṣa.*

Naisargika doṣa of *Pārada* can be eliminated by means of triturating it well with the decoctions of *triphala, kumāri* and *citraka*. Where as *yougika doṣas* can be eliminated by means of sublimation (*urdhwa, adhah & tiryak pātana*). Similarly *aupādika doṣa* will also be eliminated by means of purificatory techniques. Same manner *Guggulu* is usually mixed with stones, sand, bark and other substances, which should be separated with the help of *Dola yantra*. In this way *śodhana* is essential to remove the defects of the substances.

Amṛtīkaraṇa

Amṛtīkaraṇa is an important procedure found described in the context of *māraṇa* (*bhasma)* process. It is done to remove the remaining bad effects *(doṣas)* of *bhasmas* which are likely to remain in the *bhasmas* even after the *māraṇa* process. It is not essentially required for all the *bhasmas* but a few *bhasmas* like *abhraka* and *tāmra bhasma* need this to make these suitable for therapeutic uses.

Māraṇa

Metals or minerals are supposed for *māraṇa* (converted to *bhasma*) by subjecting these to grinding with vegetable extractives and heating at a specified temperature for a specified period. This renders the metals and minerals to readily absorbable form (*i.e. Rasa* form). Metals and minerals are therapeutically used only in the form of *bhasma*. By *māraṇa* process metals and minerals becomes free from toxicity and gets easily absorbed in to the body through the intestinal canal. This process also helps in increasing the therapeutic efficacy of the drug. The process of making the metals into a fine powder by applying required quantum of heat is known as *Māraṇa*. Advantages of *Māraṇa* or *Bhasmikāraṇa*.

1. To relieve various ailments.
2. For easy consumption.
3. To minimise the complications after administering the drug.
4. For easy assimilation.

In take of impure *bhasmas* leads to ill effects on the body. Hence, prior to administration of the *bhasmas* they should undergo the following tests for the judging the purity of the *bhasma*.

1. *Vāritara*
2. *Rekhapūranatwa*
3. *Apunarbhava*
4. *Uttama*
5. *Niruthikaraṇa*

Vāritara bhasma

मृतं तरति यत्तोये लोहं वारितरं हितम् । र.र.स. ८/२६

If the *bhasma* of a *loha* is very fine, so that it can float on water, such *bhasma* is called *Vāritara*.

Rekhapūrṇa bhasma

अंगुष्ट तर्जनीघृष्टं यत्तद्रेखान्तरे विशेत् । मृतलोहं तदुद्धिष्टं रेखापूर्णाभियधानतः ।। र.र.स. ८/२७

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If the *bhasma* of a metal, rubbed in between the thumb and index fingure and if it enters into the minute lines (grooves) of the fingures, such a *bhasma* is called *Rekhapūrṇa bhasma*.

Apunarbhava bhasma

गुडगुंजा सुखस्पर्शमध्वाज्यैः सह योजितम् । नायाति प्रकृति ध्मानादपुनर्भवमुच्यते ।। र.र.स. ८/२८

Apunarbhava bhasma is that, from which the original metal cannot be re-obtained even after blowing in the fire, mixing the *bhasma* with *Guḍa* (jaggery), *Guñja, Tankaṇa, Madhu* (honey) and ghee (*Ghṛta*).

Uttama bhasma

तस्योपरि गुरुद्रव्यं धान्यं चोपनयेदध्रुवम् । हंसवत्तीर्यते वारिण्युत्तम परिकीर्तितम् ।। र.र.स. ८/२९

The above *bhasma* is placed slowly upon the water and floated, and if it does not sink even after placing grains upon the *bhasma*, but floats like *swan*, such a *bhasma* is called *Unama bhasma* or *Uttama bhasma*.

Niruttha bhasma

रौप्येण सह संयुक्तं ध्मातं रौप्येण नो लगेत् । तदा निरुत्थमित्युक्तं लोहं तदपुनर्भवम् ।। र.र.स. ८/३०

The *Roupya* is mixed with the *bhasma* and blowed vigorously in fire. If, not even a little amount of *bhasma* mixes with the *Roupya*, such *bhasma* is called *Nirutha bhasma*. The said *bhasma* is *Apunarbhava* (non-re-obtainable) too.

[Take silver and any other *bhasma* to be tested in a crucible and heat it. If the weight of the silver does not alter that indicates *bhasma* is processed properly].

Nirutha & apurnarbhava are the two tests to be conducted to detect the purity of metallic *bhasmas* in particular where as the rest of the three general tests (viz. *vāritara, rekhapurantwa & uttama*) are indicated for all the *bhasma*.

Mṛtaloha

There is a reference of *mṛtaloha* in *Rasamitra* and *Rasataraṇgini*, mentioning the definition, which elaborates about the fineness of *mṛtaloha*. It does not specify about heating and procedure of preparing the *bhasma*. When the *bhasma* (literally, 'ash'; an incinerated metal or mineral) is rubbed between an index finger and the thumb, it should fill the lines on the fingertips which demonstrates its particle size. This fine *bhasma* is known as *mṛtaloha*. Thus *mṛtaloha* indicates the dead metal i.e. its *bhasma*. It was thought in the past that the *bhasma* of a metal does not contain any traces of the basic metal. The difinition of *mṛtaloha* indicates the fineness of the particle size. The procedure of killing *(māraṇa)* or preparing the *bhasma* from a metal requires intense heating. With the view of modern chemistry, these metals are converted into oxides or some compounds because of heating.

The procedure of *māraṇa kriya* or preparing a *bhasma* is the one, which enables the metals with the help of heating and some manupulations, to get them assimilable to the human body. The final product prepared, is called as *mṛtaloha*.

Bīja

निर्वापणविशेषेण तत्तद्वर्णे भवेद्यदा । मृदुलं चित्रसंस्कारं तद्बीजमिति कथ्यते ।।
इदमेव विनिर्दिष्टं वैद्यैरुत्तरणं खलु ।। र.र.स. ८/३१

Different colours are seen in a metal by various kinds of *Nirvāpana* (mixing another metal is a

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melted metal) processes. Such a metal is soft in nature and has the capability of performing specific operations. Such a metal is called *Bīja* and also named as *Uttarana* by physicians.

Tāḍana

संसृष्ट लोहयोरेकलोहस्य परिणाशनम् । प्रध्मानात् वंकनालेन तत्ताडनमुदाहृतम् ।। र.र.स. ८/३२

Tāḍana is a process in which one metal is separated from the combination of two metals, with the help of *Vankanāla* (bent pipe, used for blowing the fire).

Dhānyābhraka

चूर्णाभ्रं शालिसंयुक्तं वस्त्रबद्धं हि कांजिके । निर्यातं मर्दनाद्वस्त्राद्धान्याभ्रमिति कथ्यते ।। र.र.स. ८/३३

The powder of *Abhraka* is mixed with equal quantity of *Śāli Dhānyā* (Paddy), and tied in a strong cloth, to make a *poṭṭali*. This *poṭṭali* is kept immersed in the *Kāñji* (for one day) and rubbed vigorously by hands, by which the *Abhraka* in the form of fine powder, comes out of the pours of the cloth. such *Abhraka* is called *Dhānyābhraka*.

Satva

क्षाराम्ल द्रावकैर्युक्तं ध्यातमाकरकोष्टके । यस्ततो निर्गतः सारः सत्त्वमित्यभिदीयते ।। र.र.स. ८/३४

Any mineral compound or any ore is mixed and rubbed with the drugs prescribed in *Kṣāra varga, Āmla varga* and *Drāvaka varga.* Then it is kept in a crucible and heated intensively, in a *Koṣṭi* (furnace). By this, the metallic portion of that compound can be obtained, which is nothing but *Satva*.

Eka kolisa

कोष्टिका शिखरापूर्णैःकोलिलैर्ध्मान योगतः । मूषाकंठमनुप्राप्तैरेक कोलीसको मतः ।। र.र.स. ८/३५

The crucible containing drugs, is kept in the *Koṣṭhi* and the coal is heaped over the crucible like dune. It is then ignited and blowed. When the flames from the coal reaches the neck of the crucible, such flames are called *Ekakolisaka*.

Kokila

द्रावणे सत्वपाते च माधुकाः खदिराः शुभाः । निर्द्रवे वंशजास्ते तु स्वेदने बादराः शुभाः ।। र.र.स. ८/३६

The *Kokila* (coal), derived from the wood of *Madhūka* and *Khadira* are said to be best for the *Drāvaṇa* (liquifying) of metals or *Satvapātana* of minerals. Whenever it is not necessary to melt the metal (or which melts with difficulty), there, if intensive fire is desired, the coal derived out of wood of *Vamśa* (Bamboo) is prepared. For the process of *śwedana*, the coal of wood of *Badara* is used.

Hingulākṛṣṭa Pārada

विद्याधरारव्य यन्त्रस्थादार्द्रक द्रवमर्दितात् । समाकृष्टो रसो यो सौ हिंगुलाकृष्ट उच्यते ।। र.र.स. ८/३७

Hingulākṛṣṭa Pārada is that *Pārada*, which is obtained from *Hingula* by grinding it in the juice of *Ārdraka*, keeping it in *Vidyādhara Yantra* and subjected to intensive heat.

Ghoṣākṛṣṭa Tāmra

स्वल्पतालयुतं कांस्यं वंकनालेन ताडितम् । मुक्तरंग हि तत्ताम्रं घोषकृष्टमुदाहृतम् ।। र.र.स. ८/३८

The powder of *Kāṁsya* is added with *Haratāla* little by little continuously, and while mixing,

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fire is blown with the help of *Vankanāla*, until the *Vanga* (tin) is completely destroyed (burnt off) and only *Tāmra* is remained. Such a *Tāmra* is called *Goṣākṛṣṭa Tāmra*.

Varanaga

तीक्ष्ण नीलांजनोपेतं ध्मातं हि बहुशो दृढम् । मृदु कृष्णं दुतद्रावं वरनागं तदुच्यते ।। र.र.स. ८/३९

Equal quantities of *Tīkṣṇa loha* and *Nīlāñjana* are taken in a crucible and heated by intensive blowing, repeatedly, This yields a soft, black and quickly melting alloy, which is known as *Varanaga*.

Utthāpana

मृतस्य पुनरुद्भूतिः सम्प्रोक्तोत्थापनाख्यया । र.र.स. ८/३९

Utthāpana is the process, by which the original metal is re-obtained from its *bhasma*.

Dhālana

दुतद्रव्यस्य निक्षेपो द्रवे तद् ढालनं मतम् ।। र.र.स. ८/४०

The process in which, a melted metal is poured in any liquid, is called *Dhālana*.

Nagasambhūta Capala

त्रिशंत् पलामितं नागं भानुदुग्धेन मर्दितम् । विमर्द्य पुटपेत्तावद्यावत्कर्षांश शोषितम् ।।
न तत्पुटसहस्त्रेण क्षयमायाति सर्वथा । चपलोयं समादिष्टो वार्तिकैर्नागसम्भवः ।। र.र.स. ८/४१-४२

30 pala (120 tola) of *Nāga* (lead) is powdered well and ground in latex of *Arka*. Then it is kept in *Śarāvasaṁpuṭa* and subjected to *Gajapuṭa*. This process is repeated several times, until only one *pala* (4 tola) of *Nāga* is remained at the end. This resultant material, subjected even to one thousand *puṭas*, would not loose its weight. Such a specific substance is called *Nāgasambhava Capala*.

Vangasamabhūta capala

इत्थं हि चपलः कार्यो वंगस्यापि न संशयः । तत् स्पृष्ट हस्त संस्पृष्टः कवलो बध्यते रसः ।।
स रसो धातुवादेषु शस्यते न रसायने । अयं हि खर्वणाख्येन लोकनाथेन कीर्तितः ।। र.र.स. ८/४३-४४

Vangasambhava Capala can also be obtained, without any doubt, as derived from *Nāga*. Such a *Capala* if smeared to the hands and *Pārada* is touched, the *Pārada* becomes *baddha* (immobile). Such a *Baddha Pārada* is useful in *Dhātuvāda*. However, it can not be used in *Rasāyana* processes. These operations (of *Nāgasambhava Capala* and *Vangasambhava Capala*) are expounded by *Kharvana* the *Lokanātha* (The Lord of universe).

Dhouta

भूभुजंग शकृत्तोयैः प्रक्षाल्यापहृतं रजः । कृष्ण वर्णं हि तत्प्रोक्तं धौताख्यं रसवादिभिः ।। र.र.स. ८/३५

The faecal matter of the *Bhūnāga* (earthworms) if washed in water several times, a black powder is available. It is called *Dhouta* by *Rasasiddhas*.

Dvandvana

द्रव्ययोर्मद नार्दध्मानाद्वन्द्वानं परिकीर्तितम् ।। र.र.स. ८/४६

Dvandvana is a process, in which two substances (preferably metals) are ground and blowed in the fire in order to unite them.

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Anuvarna

भागाद्द्रव्याधिक क्षेपनमनुवर्ण सुवर्णकि ।। र.र.स. ८/४७

It is a process in which a substance is added in excessive quantity than specified, to any other substance. It is also called *Anuvarna* of *Suvarnaka*.

Bhanjani

द्रवैर्वा वह्निकाह्लासो भंजन वादिभिर्मता ।। र.र.स. ८/४८

When a burning fire is extinguished, either with the help of liquids, like water or any other substance, the process is called *Bhanjani*.

Patangi

पतंगि कल्कतोजाता लोहे तारे च हेमता ।। र.र.स. ८/४९

If the *Loha* or *Roupya* attains the colour of *Swarṇa*, under the influence of the *kalka* of any of the drug, then it is called *Patangi*.

Cullika

दिनानि कतिचित्स्तित्वा यात्ससौ चुल्लिका मता ।। र.र.स. ८/५०

If the above *Patangi* colour, retains, for few days but *vanishes* later, such a condition is called *Cullika*.

Patangi rāga

रंजिताद्धि चिरल्लोहाद् ध्मानाद्वा चिरकालतः । विनिर्यसः स निदिष्टः पतंगीराग संज्ञक ।। र.र.स. ८/५१

Under the influence of drugs, the metals are made to obtain the colour of gold. This colour is then separated from the metal by subjecting it to intensive fire or by any other method. Such a separated colour is called *Patangi rāga*.

Āvapa

दुते द्रव्यांतरक्षेपो लोहाद्ये क्रियते हि यः । स आवापः प्रतवापस्त देवाऽऽच्छादनं मतम् ।। र.र.स. ८/५२

It is a process in which any other substance are put into the liquified metals etc. It is also called *Prativapa* or *Āchadana*.

Abhiṣeka

दुते वान्हिस्थिते लोहे विरम्याष्ट निमेषकम् । सलिलस्यं परिक्षेपः सोऽभिषेक इति स्मृतः ।। र.र.स. ८/५३

Abhiṣeka is a process in which metals are melted and let it stand for 8 *nimeṣa* and water is poured over it.

Nirvāpa

तप्तस्याप्सु विनिक्षेपो निर्वापः स्नपनंच तत् ।। र.र.स. ८/५४

Substances like metals are heated in fire and immersed in the liquids like water. Such a process is named as *Nirvāpa* or *Snāpana*.

प्रतिवापादिकं कार्यं दुते लोहे सुनिर्मले ।। र.र.स. ८/५५

The process like *Prativāpa*, *Abhiṣeka* etc. are carried out, only when the metals are melted properly and become clear.

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Śuddhavarta

यदा हुताशो दीप्तार्चिः शुक्लोत्थान समन्वितः । शुद्धावर्तस्तदा ज्ञेयः स कालः सत्व निर्गमे ।। र.र.स. ८/५६

The flames are called *Śuddhāvarta*, which occur when the fire burns intensively. Such a condition is indication of the retrieving out the *Satva* of the minerals.

Bījavartha

द्राव्यद्रव्यनिभा ज्वाला दृश्यते धमने यदा । द्राव्यस्योन्मुखता सेयं बीजावर्तः स उच्यते ।। र.र.स. ८/५७

Whenever a metal is blown in the fire, in order to melt it, a specific coloured flame, partaining to the colour of the metal, is seen in the fire. It is an indicative of the melting of that metal. Such a condition is called *Bījavarta*.

Swāngaśīta-Bahiśīta

वन्हिस्थमेव शीतं यत्तदुक्तं स्वांगशीतलम् । अग्नेराकृष्य शीतं यत्तद् बहिः शीतमुच्यते ।। र.र.स. ८/५८

While heating a substance on fire, if the substance is let to cool on its own accord (keeping it on fire until the fire extinguishes on its own), then such a condition is called *Swāngaśīta*. However the substance (or container) if removed from the fire and cooled outside, it is called *Bahiśīta*.

Drāvakagaṇa

गुन्जामधु गुडः सर्पिः सौभाग्यं गुग्गुलुस्तथा। पूर्वाचार्यैः कीर्तितोऽयं धातूनां द्रावको गणः।। र.त. २/३५

Guñja, madhu, guḍa, ghṛta, tankaṇa and *guggulu* etc. are included in *Drāvakagaṇa*. These drugs act as catalysts during the melting process of metals which are otherwise cannot be liquefied. The above drugs except *guggulu* are also useful for testing *bhasmas* (*apunarbhava test*).

Mitrapañcaka

All the drugs belonging to *Drāvakagaṇa* except *guḍa* can be called as *Mitrapañcaka*, which are useful to accelerate the liquefaction process of metals.

Triphala (Three Fruits)

पथ्याबिभीतधात्रीनां फलैः स्यात्त्रिफला समैः । फलत्रिकं च त्रिफला सा वरा च प्रकीर्तिता ।।

(भा. प्र. हरी. ४२)

Collective name of fruits of *harītaki* (Terminalia chebula Retz.), *bibhītaki* (Terminalia belerica Roxb.) and *āmalaki* (Emblica officinalis Gaertn). Generally, the pulp (*phalatwak*) of these fruits is used in medicine and taken in equal quantities.

One fruit of *harītaki*, two fruits of *bibhītaki* and four fruits of *āmalaki* constitute one unit of *triphala* according to some *Ācāryas*.

Trikaṭu (Three Pungent Drugs)

पिप्पली मरिचं शुण्ठी त्रिभिस्त्र्यूषणमुच्यते । (शा. सं. म. ६.१२)

Collective name for *śuṇṭhi* (Zingiber officinale Roscoe), *pippali* (Piper longum Linn.) and *marica* (Piper nigrum Linn), taken in equal quantities.

Kṣāra Dvaya (Two Alkalies)

Svarji kṣāra (Sodium bicarbonate) and *yava kṣāra* (alkali preparation of barley ash contain-

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ing Potassium bicarbonate and Potassium Carbonate) these two taken together are called *kṣāra dvaya.*

Kṣāra Traya (Three Alkalies)

क्षारत्रायं समाख्यातं यवसर्जिकटङ्कणम् । रसरत्न समु. १०.६८

Svarji kṣāra, vava kṣāra and *saubhāgya* or *tankaṇa* (borax) these three taken together in equal quantity and are called *kṣāra traya.*

Kṣāra Pañcaka (Five Alkalies)

पलाशमुष्ककक्षारौ यवक्षारः सुवर्चिका । तिलनालोभ्दवः क्षारः संयुक्तं क्षारपञ्चकम् ।। (रसरत्नसमु. १०.६१)

Kṣāras (alkali preparations) of *kadali* (Musa paradisiaca Linn.), *muṣkaka* (stereospermum suaveolens DC.), *kimsuka* (Butea monosperma Kuntze) and *tila* (Sesamum indicum Linn.). and *Sarja Kṣāra* - these five taken together are called *kṣāra pañcaka.*

Kṣāraṣṭaka (Eight Alkalies)

पलाशवज्रिशिखरिचिञ्चार्कतिलनालजाः । यवजः स्वर्जिका चेति क्षाराष्टकमुदाहृतम् ।। (भा. प्र. हरी. २५९)

Kṣāras (alkali preparations) of *snuhī* (Euphorbia nerifolia linn.), *palāśa* (Butea monosperma Kuntze), *apāmārga* (Achyranthes aspera Linn.) *ciñca* (Tamarindus indica Linn.), *arka* (Calotropis gigantea R.Br. ex Ait), *tila* (Sesamum indicum linn.), *yava* (Hordeum vulgare Linn.) and *sarja kṣāra* (sodium bicarbonate) these eight taken together in equal quantity and are called *kṣāraṣṭaka.*

Mūtraṣṭaka (Eight Types of Urine)

अविमूत्रमजामूत्रं गोमूत्रं माहिषं च यत् । हस्तिमूत्रमथोष्ट्रस्य हयस्य च खरस्य च ।। (च. सू. ९.१४)

Urine of she buffalo, she goat, female sheep, cow, male camel, male ass, male elephant and horse - these eight taken together are called *mūtrāṣṭaka.*

Āmla Varga (Group of Sour Drugs)

जम्बीरं निम्बुकञ्चैव त्वम्लवेतसमम्लिका । नारङ्गः दाडिमञ्चैव वृक्षाम्लं बीजपूरकम् ।।
चाङ्गेरी चणकाम्लञ्च कर्कन्धुः करमर्दकः । चुक्रिका चेति सामान्यदम्लवर्गः प्रकीर्तितः ।। (र. तर. २.१३-१४)

Jambīra (Citrus limon burm.f.), *nimbuka* (citrus aurantifolia Swingle), *amla vetasa* (Garcinia pedunculate Roxb.), *amlika* (Tamarindus indica Linn.), *nāraṅga* (Citrus reticulate Blanc.), *dāḍima* (Punica granatum Linn.), *vṛkṣāmla* (Garcinia indica Chois.), *bīja pūraka* (Citrus medica Linn.), *cāṅgeri* (Oxalis corniculata Linn.), *caṇakāmla* (Cicer arietinum Linn.), *karkandhu* (Zizyphus nummularia W. & H.), *kara mardaka* (Carissa carandas Linn.) and *cukrika* (Rumex vesicularis Linn.) these drugs taken together are called *āmla varga.*

Āmlavarga according to another texts includes–*āmlavetasa, dāḍima, jambira, kola, nimbu, ambaṣṭa, bijapūraka, tintidika, cāngeri, nārañga, caṇakāmla, rasapatrika* (*cukrika*), *āmlika* and *karāmarda.* Among *Āmlavarga dravyas, caṇakāmla* alone or *āmlavetasa* are considered to be the best drug of choice for *jāraṇa* and *dravaṇa* of *rasa* (purifying, liquefication and exhaustion of mercury).

Āmla pañcaka (Five Sour Drugs)

Āmla vetasa, jambira, mātulunga (*bija pura*), *nāranga* and *nimbuka* - these five taken together are called *āmla pañcaka.*

Kola (Zizyphus jujuba Linn.), *dāḍima* (Punica granatum Linn.), *vṛkṣāmla* (Garcinia indica

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Chois.), *cāngeri* (Oxalis corniculata Linn) and *ciñca* (Tamarindus indica Linn.) these five drugs taken together are called *āmla pañcaka.*

All the sour group substances are useful for *Pārada jāraṇa. Āmlapañcaka* therapeutically is indicated for the management of thirst and also useful of *mukha lepa.*

Pañca Tikta (Five Bitter Drugs)

गुडूची निम्बमूलत्वक-भिषङ्माता निदिग्धिका । पटोलपत्रमित्येतत् पञ्चतिक्तं प्रकीर्तितम् ।। (रसतरं २.१८)

Guḍūci (Tinospora cordifolia Miers), *Nimba* (Azadirachta indica A. Juss.), *vāsa* (Adhatoda vasica Nees), *Kaṇṭakāri* (Solanum xanthocarpum Schrad and Wendle.) and *paṭola* (Trichosanthes cucumerina Linn.) these five drugs taken together in equal quantity and are called *pañca tikta.*

Pañca Mṛttika (Five Clays)

इष्टिका-गैरिका-लोणं भस्म वल्मीकमृत्तिका । रसप्रयोगकुशलैः कीर्त्तिताः पञ्चमृत्तिकाः । (र. र. समु. १०.८१)

Powder of brick, ash, earth from ant-hill, *gairika* (red ochre) and salt - these five taken together are called *pañca mṛttika.*

Madhura Traya (Three Sweet Drugs)

घृतं गुडो माक्षिकञ्च विज्ञेयं मधुरत्रयम् । र. र. समु. १०/७०

आज्य गुडो माक्षिकञ्च विज्ञेयं मधुरत्रिकम् । मतं त्रिमधुरश्चापि तथैव मधुरत्रयम् ।। र.त. २/२०

Ghee, Jaggery, and honey - these three taken together in equal quantity and are called *madhura traya.*

Pañcāmṛta (Five Nectars)

गव्यं क्षीरं दधि घृतं माक्षिकं चाथ शर्करा । पञ्चामृतं समाख्यातं रसकर्मप्रसाधकम् ।। (रस. २/२१.)

Cow's milk, curd of cow's milk, cow's ghee, honey and sugar - theses five together in equal quantity and are called *Pañcāmṛta.*

Pañca Gavya (Five Cow-products)

गव्यक्षीरं दधिघृतं माक्षिकश्चाथ शर्करा । पञ्चामृतं समाख्यातं रसकर्म प्रसाधकम् ।। र. त. २/२१

गव्यं क्षीरं दधि घृतं गोमूत्रं गोमयं तथा । एकत्र योजितं तुल्यं पञ्चगव्यमिहोच्यते ।। र.र. स. २.२२

Milk, curd, ghee, urine and dung of the cow - these five taken together in equal quantity and are called *pañca gavya.*

Kṣīra Traya (Three Milky Latexes)

The latexes of *arka* (Colotropis gigantea R.Br. ex Ait.), *vaṭa* (Ficus bengalensis Linn.) and *snuhi* (Euphorbia nerifolia linn.) these three taken together are called *kṣīra traya.*

Dudgha Varga (Group of Milks)

Milk of she elephant, mare, cow, female sheep, she goat, she camel., she buffalo, she ass and woman and the milky latexes of *kakodumbara* (Ficus hispida Linn. F.), *snuhi* (Euphorbia nerifolia Linn.), *dugdhika* (Euphorbia hitra Linn.), *udumbara* (Ficus racemosa Linn.), *arka* (Calotropis gigantea R. Br. ex. Ait.), *nyagrodha* (Ficus bengalensis Linn.), *asvattha* (Ficus religiosa Linn.), and *tilvaka* (Symplocos racemosa Roxb.) – all these taken together are called *dugdha varga.*

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Taila Varga (Group of Oils)

कङ्गुणी तुम्बिनी घोषा करीरश्रीफलोभ्दवम् । कटुवार्त्ताकसिद्धार्थसोमराजीबिभीतजम् ।।
अतसीजं महाकाली निम्बजं तिलजं तथा । अपामार्गाद्देवदाली दन्ती तुम्बुरूविग्रहात् ।।
अङ्कोलोन्मत्तभल्लातपलाशेभ्यस्तथैव च । एतेभ्यस्तैलमादाय रसकर्मणि योजयेत् ।।

(र. र. समु. १०/७२-७३)

Kanguṇī, Kaṭutumbi, Ghoṣa, karera, Bilwaphala, Narikela, Kaṭuvārtaka, Siddhārtha, Somarāji (Bākuci), Bhibhitaka, Atasi, Mahakāli, Nimbabīja, Tila, Apamārga, Devadāśa, Tumburu, Ankola, Dhattūra, Bhallātaka, Palāśa are the plants which contain oil and can yield the oil which is extracted from them and used in *Rasa Karma.*

Govara (Cow Dung Powder)

In the out-door cow-shed the dung gets dried up and because of the pressure of the hooves of cattle it becomes powder. This is called *govara.*

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Chapter 3

YANTRA

AUṢADHA NIRMĀṆAŚĀLĀ (RASAŚĀLA) AND YANTRAS

Before entering into the selection and processing of *auṣadhi* for therapeutic purposes, it is necessary to get acquainted about the selection of place and construction of the *Rasaśālā* and selection of teacher, students, physicians as well as helpers for this work. An outline of the same is provided below:

Construction

While selecting a place for the establishment of a pharmacy and during construction,following points should be kept in view :

1. It should be free from impediments- both man made and providential; 2. Green and dried herbs should be available in the capus or nearby or they can be cultivated and stored inside; 3. It should look beautiful and be located near the sources of water like well, ponds and revers; 4. The area should be surrounded by a boundary wall; 5. The statue of *Rasa bhairava (Rasa liṅga)* should be located in the eastern side; 6. In *agni koṇa* (south- east direction) fire-place, ovens etc. required for cooking should be located; 7. Equipements for trituration, making paste, etc. should be located in the southern side; 8. *Nairṛtya koṇa* (place in the south-east direction) should be used for manufacturing and storing *yantras* (cooking equipments); 9. The place in western side should be used for washing; 10. Green herbs and freshly prepared medicines should be dried in the *vāyavya koṇa* (north-western direction); 11. The place in the northern side should be used for processing mercury and other metals as well as minerals; 12. *Bhasma* (processed fine powders of mercury, metals and minerals), tablets, medicated oils, medicated ghee, linctus, etc. should be stored in the house located in the *īśāna koṇa* (north eastern direction).

Equipments and raw drugs

The following equipments and raw drugs which are frequently required should be stored in the pharmaceutical laboratory:

1. Pestles and mortars of different size and shape. These are made of either stone or iron or crystals; 2. Bottles, pots, cups, plates, utensils and jars made of glass mud wood as well as metals for storing raw drugs and finished products; 3. Equipments like forceps, spatula, spoon, knife, scissors, sieves, crucibles and *yantras* (for cooking); 4. Weighing machines and balances of different capacity and shape; 5. Different types of fuel like wood, cow-dung cake, coal, charcoal and husk; and 6. Murcury, other metals, minerals, drugs of vegetable origin, animal products, poisons of vegetable and animal origin, salts, alkalies, gems and jewels.

Pharmacy assistants

Attendant to be employed in the pharmacy for assisting the physician in the processing and manufacture of various categories of drugs should have the following characteristics:

1. He should be energetic and enthusiastic to learn and assist the physician;
2. He should have physical and mental purity;
3. He should be brave, strong and careful;
4. He should be truthful, sincere and honest; and
5. He should take only wholesome food and regimens.

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Teacher of Rasa Śāstra

A teacher of *Rasa Śāstra* should have the following characteristic features:

1. He should be of noble character and high morality and be compassionate, kind and truthful;
2. He should have attained perfection in the practice of *mantras*;
3. He should be a devotee of *Lord Śiva*;
4. He should have patience, courage and be in harmony with the laws of nature; and
5. He should be well versed in various aspects of *Rasa Śāstra* – both the theory and the practice.

Suitable students of Rasa Śāstra and Bhaiṣajya kalpanā

Because of immense potentiality for being misused for materialistic and selfish gains which are to be strictly avoided, it is necessary to carefully examine the student before he is initiated to this branch of science. Such a student should have the following characteristic features:

1. He should be of noble character, high morality, expert in his traditional profession, respectful to teacher, brave , truthful, determined to acquire knowledge, obedient and free from laziness;
2. He should belong to a noble family, be clever and should be well versed in the theory and practice of other branches of *Āyurveda;* and
3. He should be completely devoted to the teacher and his studies.

Unsuitable students

Persons having the following characteristic features are not suitable for teaching;

1. Persons of bad character and conducts;
2. Persons borne in a low family;
3. Persons who are egoistic, thieves deceptive and desirous of acquiring knowledge by any means;
4. Persons of unknown family lineage and conduct;
5. Persons who do not believe in the existence of *God*, sacred scriptures and life after death; and
6. Persons who speak ill of the teacher.

Physicians for Rasaśāla

To help the teacher in day to day work, some physicians should be employed in the Pharmacy and they should be as follows:

1. They should be specially interested in this branch of *Āyurveda* dealing with the processing of mercury, other metals, minerals, gems and jewels;
2. They should be acquainted with the identification and properties of drugs;
3. They should be acquainted with the explanation of different technical terms which often carry a secret implication; and
4. They should acquainted with the name of drugs in different regional languages.

Amṛta Hasta Vaidya

Certain physical signs and mental attitude determine the superiority of the physician. When a medicine is touched by their hands, the effect becomes more. They are called *Amṛta hasta,* i.e., one having nectar in the hand. These are as follows:

1. Auspicious signs like flag, jar, lotus, fish and bow in the palm; and
2. A line below the ring finger going downwards.

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YANTRA

स्वेदादिकर्मनिर्मातुं वार्तिकेन्द्रैः प्रयत्नतः। यन्त्र्यते पारदो यस्मातस्माद्यन्त्रमिति स्मृतम्।। (र.र.स. ९/२)

रसो नियन्त्र्यते येन यन्त्रं तदिति उच्यते। (आ.क. २६/१)

रसोपरसलोहाद्यः मारणाद्यर्थसिद्धये। यन्त्र्यन्तऽनेन यस्मात्तु तस्मात् यन्त्रं प्रकीर्तितम्।। (र.त. ४/१)

After studying all the *Rasa Tantra* texts critically the various apparatuses invented by the highly expert scholars (alchemists) taking all possible care, are being mentioned here precisely by *Śomā Deva* to perform *Śvedana* (eating through liquids/vapours) procedures.

Yantra Nirukti

These are known *Yantras* as these can control/restrict mercury drugs while precessing.

अथ यन्त्राणि वक्ष्यन्ते रसतन्त्राण्यशेषतः। समालोच्य समासेन सोमदेवेन साम्प्रतम्।। (र.र.स. ९/१)

Śrī Śamadeva, the *Rasasiddha* has described the *Yantra* instruments, after refering all the relevant texts.

For the purification and *māraṇa* of metals, minerals, gems and jewels, various types of equipment are used. Some of these specially designed equirpments are used for the preparation of medicines out of metals etc. These equipments can be prepared by clay, iron or stainless steel. Some of these commonly used equipments are described hereafter.

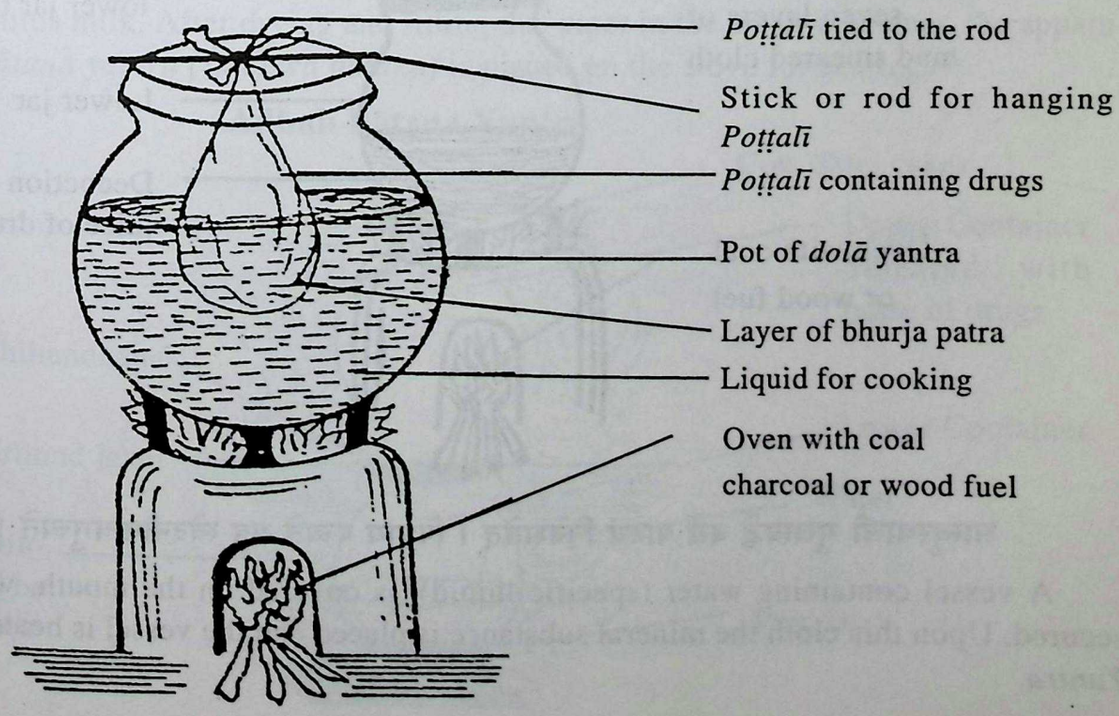
Definition of Yantra

स्वेदादिकर्मनिर्मातुं वार्तिकिन्द्रैः प्रतत्नतः। यन्त्रयते पारदो यस्मात्तस्माद्यन्त्रमिति स्मृतम्।। (र.र.स.९/२)

Yantra are the instruments which are used for the difficult operations of controlling *Pārada* by performing the processes like *Śwedana* (boiling) etc.

Some of the commonly using *Yantras* with their relevant diagrams and other *yantras* which are rarly used without diagrams mentioned below.

Dolā Yantra



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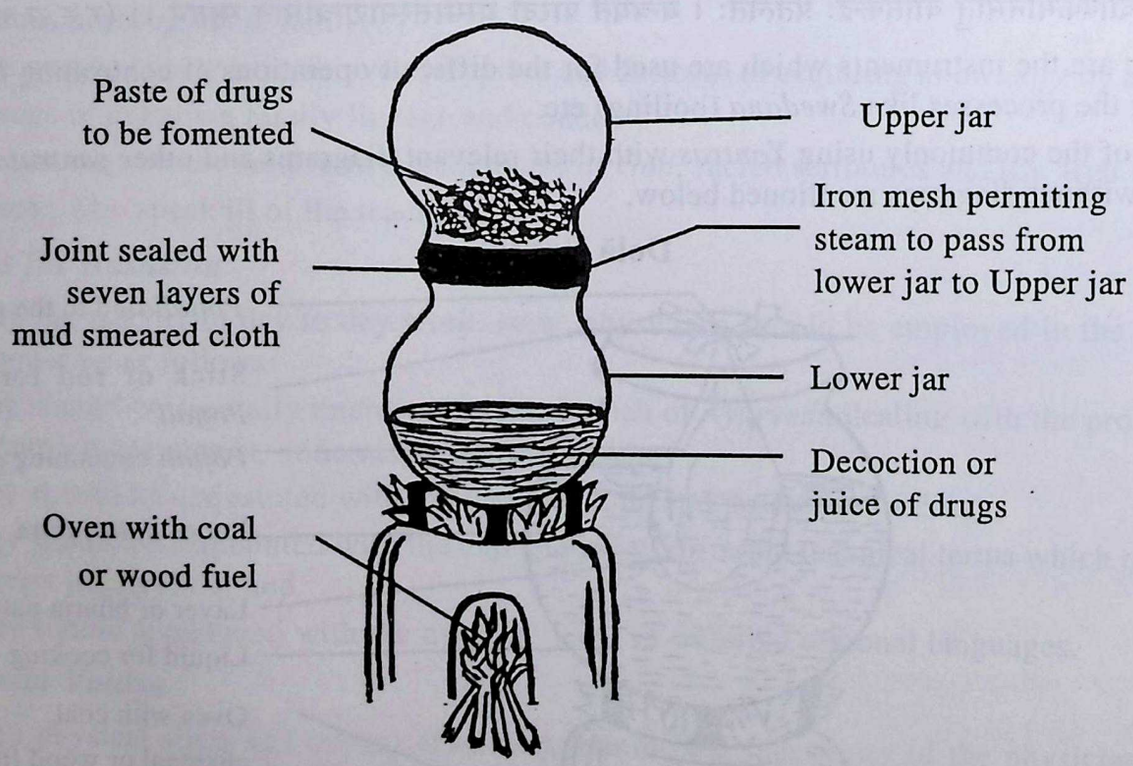
Fill the pot to its half with the prescribed liquid. Make two holes/openings carefully at the neck of the pot. Fix a rod in the holes, suspend *Rasa-poffali* (bundle containing mercury & other drugs) in the middle of the rod and apply heat through boiling liquid. The assembly is known as *Dolā Yantra.*

द्रवद्रव्येण भाण्डस्य पूरितार्धोदकस्य च। मुखस्योभयतो द्वारद्वयं कृत्वा प्रयत्नतः ।।
तयोस्तु निक्षिपेद्दण्डं तन्मध्ये रसपोटलीम्। बध्वा तु स्वेदयेदेतद्दोलायन्त्रमिति स्मृतम् ।। (र.र.स.९/३-४)

The drug which is required to be cooked is wrapped with a, piece of cloth. This cloth should be hanged through a string from a stick or rod kept over a pot in such a way that no part of the cloth should touch either the sides or the bottom of the container. Then the pot should be filled up with the liquid prescribed for the purpose till it reaches upto half of the level of the *poṭṭalī*. Thus the lower half of the *poṭṭalī* remains immersed in the liquid.

The container should then be placed over the fire. As the boiling starts, the level of liquid will go down. Periodically, therefore, more of the liquid should be added to the container or the *poṭṭalī* should be brought down wards so that it always remains immersed in the liquid upto half of its level. Some physicians prefer to cover the jar with a lid so that the evaporated moisture falls down after being condensed and there is very little loss of the fluid. In this way, boiling should continue till the prescribed period. Thereafter, the jar should be taken out of the fire, cooled and the *poṭṭalī* should be removed from the liquid. It should then be untied, the drug should be washed with warm water and dried up by keeping in the sun. This is called *dolā yantra.*

Śwedani Yantra



साम्बुस्थाली मुखाबद्धे वस्त्रे पाक्यं निवेशयेत्। पिधाय पच्यते यत्र स्वेदनीयन्त्रमुच्यते ।। (र.र.स.९/५)

A vessel containing water (specific liquid), is covered on the mouth, with a strong cloth and secured. Upon this cloth the mineral substance is placed and the vessel is heated. It is called *Śwedani Yantra.*

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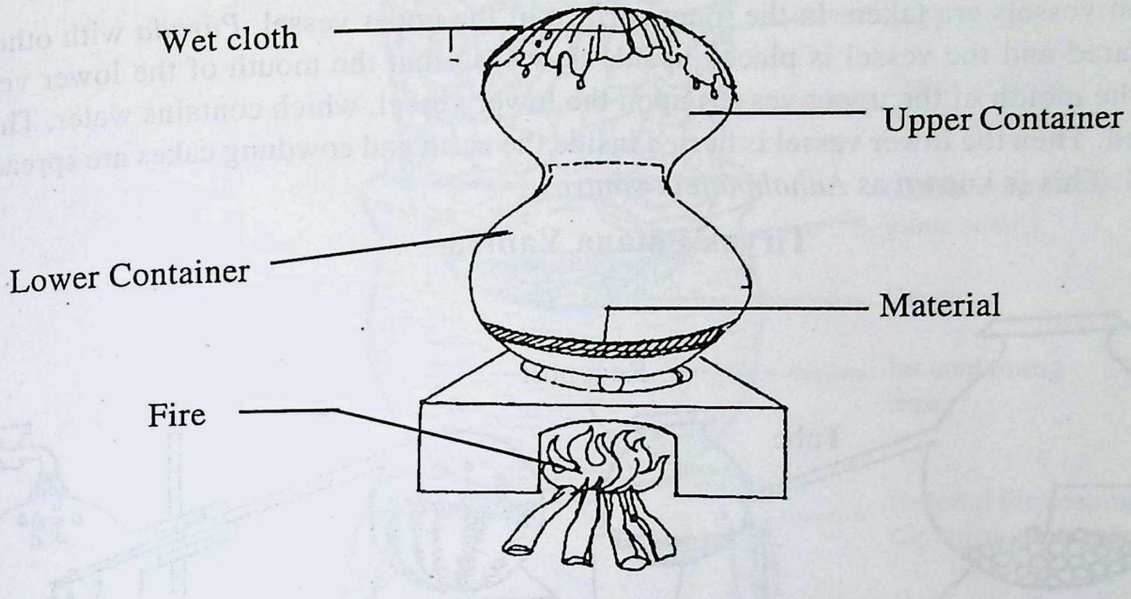
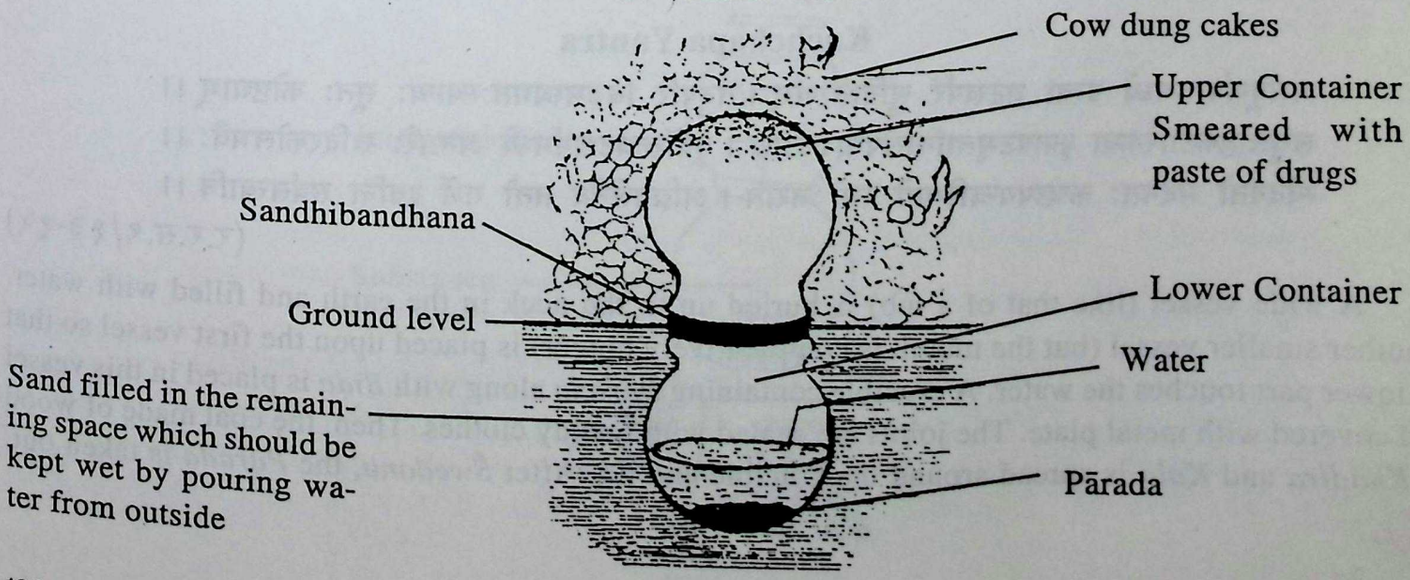
Ūrdhwa Pātana Yantra



अष्टांगुलपरीणाहमानाहेन दशांगुलम् । चतुरंगुलकोत्सेधं तोयाधारं गलादधः ।।
अधोभाण्डे मुखं तस्य भाण्डस्योपरिवर्तिनः । षोडशांगुलविस्तीर्णपृष्टस्यास्ये प्रवेशयेत् ।।
पार्श्वयोर्महिषीक्षीरचूर्णमण्डूरफाणितैः । लिप्त्वा विशोषयेत्सन्धि जलाधारे जलं क्षिपेत् ।
चुल्ल्यामारोपयेद्यत्नात्पातनायन्त्रमुच्यते ।। (र.र.स.९/६-८)

A vessel , the bottom of which is measuring 16 *anguli* (about 12") in width (or diameter), is taken and at its outer convex bottom, a water container (an earthen tank which can hold water) is built which measures *10 angula* (7.5") long, 8 *angula* (6") wide and 4 angula (3") high. Another vessel, the mouth of which is smaller than that of first vessel (i.e. its mouth can be inserted into the mouth of the other bigger vessel) is taken and filled with mineral substances. Upon this vessel, the bigger vessel is placed inverted, so that the mouth of the lower vessel is entered in to the mouth of the upper vessel. The joining parts are scaled with the paste papared by grinding the powders of lime, *Maṇḍūra* (oxide of iron), *Phāṇita* in buffallos milk. After drying and filling the water in the water container, the apparatus, which is called *Pātana yantra (Ūrdhwa pātana)* is placed on the stove for heating.

Adhah Pātana Yantra



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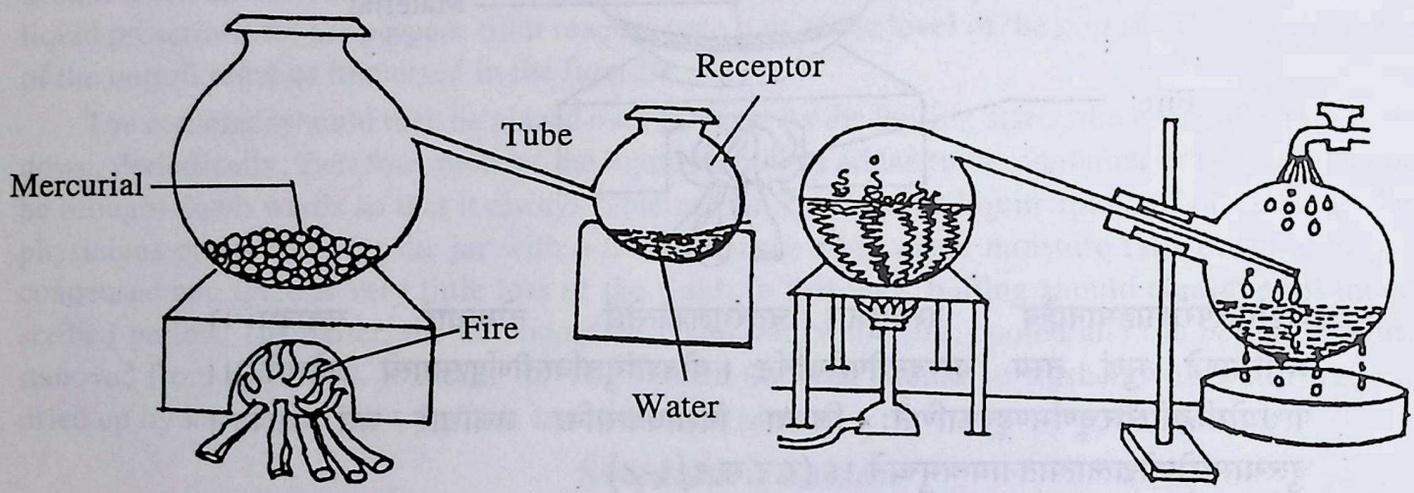
अथोर्ध्वभाजने लिप्तस्थापितस्य जले सुधीः । दीप्तैर्वनोपलैः कुर्यादधःपातं प्रयत्नतः ।। (र.र.स. ९/९)

Two earthen vessels are taken. In the inner surface of the upper vessel, *Pārada* with other substances are smeared and the vessel is placed upside down (so that the mouth of the lower vessel is inserted inside the mouth of the upper vessel) upon the lower vessel, which contains water. The joint is properly sealed. Then the lower vessel is buried inside the earth and cowdung cakes are spread upon the upper vessel. This is known as *Adhahpātana yantra*.

Tiryak Pātana Yantra



क्षिपेद्रसं घटे दीर्घे नताधोनालसंयुते । तन्नालं निक्षिपेदन्यघटकुक्ष्यन्तरे खलु ।।
तत्र रुध्वा मृदा सम्यग्वदने घटयोरथ । अधस्ताद्रसकुम्भस्य ज्वालयेत्तीव्रपावकम् ।।
इतरस्मिन्घटे तोयं प्रक्षिपेत्स्वादु शीतलम् । तिर्यक्पातनमेतद्धि वार्तिकैरभिधीयते ।। (र.र.स.९/१०-१२)

A vessel of more height is taken and a tube is connected to its neck portion. The other end of the tube is projected into the body of the another vessel, kept on a lower plane. After putting necessary substances in the first vessel and water in the second, the mouths of these are closed and sealed (the connecting portions of the tube too are sealed). Then, the first vessel is kept on fire and heated. The scholars of *Rasaśāstra* have named it as *Tiryak Pātana Yantra*..

Kachchapa Yantra

जलपूर्णपात्रमध्ये दत्त्वा घटखर्परं सुविस्तीर्णम् । तदुपरि बिडमध्यगतःस्थाप्यः सूतः कोष्ठ्याम् ।।
लघुलोहकटोरिकया कृतपटमृत्सन्धिलेपयाऽच्छाद्य । पूर्वोक्तघटखर्पमध्ये अन्गारैः खदिरकोलभवैः ।।
स्वेदनतो मर्दनतः कच्छपयन्त्रस्थितो रसो जरति । अग्निबलेनैव ततो गर्भे द्रवन्ति सर्वसत्त्वानि ।।

(र.र.स.९/१३-१५)

A wide vessel (like that of a tub) is buried up to the neck in the earth and filled with water. Another smaller vessel (but the mouth is comparatively bigger) is placed upon the first vessel so that its lower part touches the water. A crucible containing *Pārada* along with *Bīḍa* is placed in this vessel and covered with metal plate. The joints are sealed with muddy clothes. Then, the coal made of wood of *Khādira* and *Kola* is spread around the crucible and lid. After *Śwedana*, the *Pārada* is taken out,

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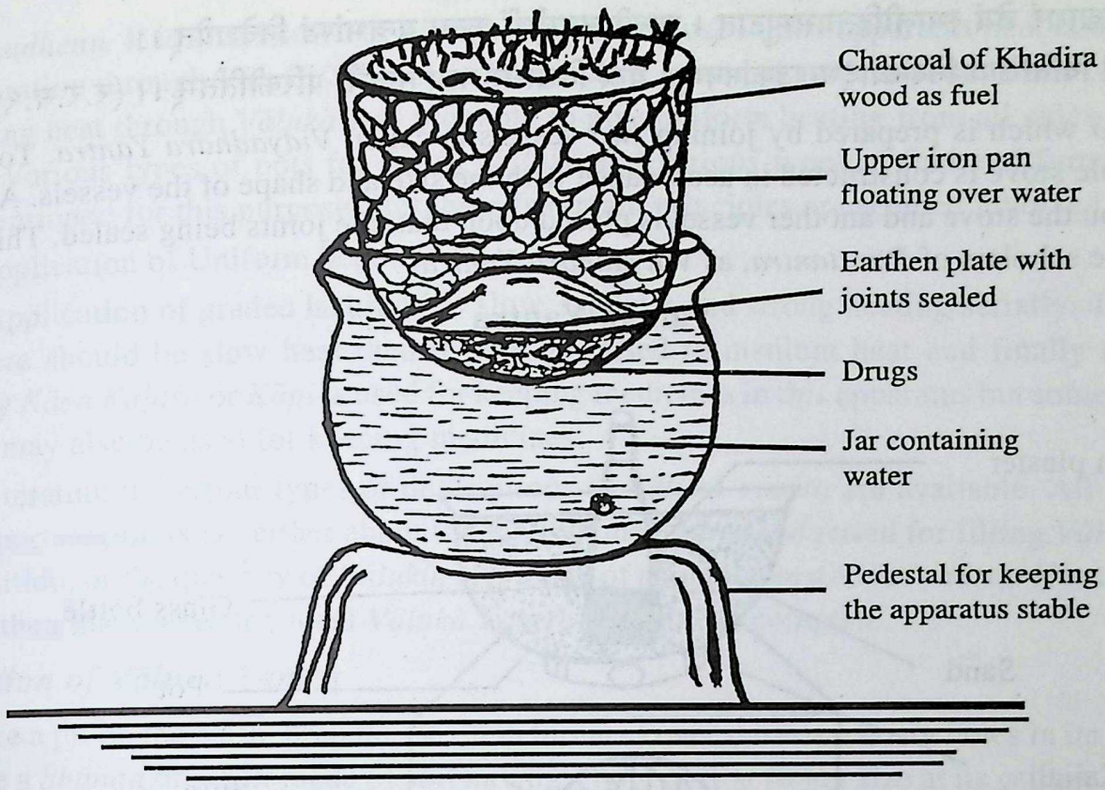
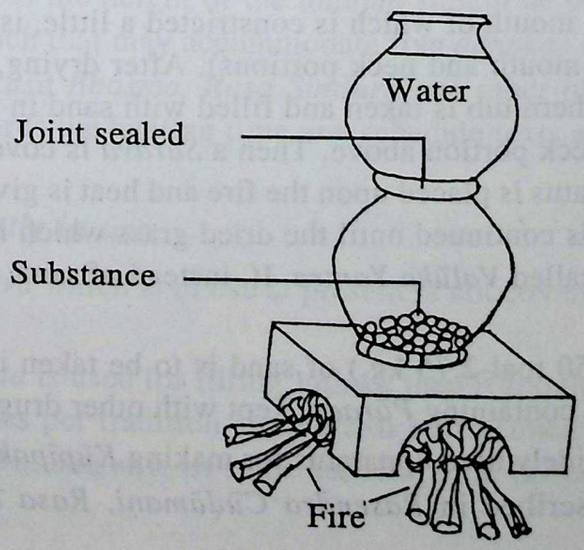


after *Śwāngaśīta*. This *Pārada* thus processed in *Kachchapa yantra* becomes hungry (*bubhukṣīta*) and attains the power of melting all kinds of *satvas* and other substances, quickly.

Place a shallow bowel shaped lower half of a pot (like begger's bowl) over the pot filled with water. Place a ma (crucible) containing mercury covered all around with. vidadravya in the bowel shaped half pot. Cover it with small iron cup, seal the joints with a cloth immersed in mud and allow it to dry. Apply heat through *khadira* and *kolā ahgtira* (burning charcoal) inside the bowel. This *kācchapa yantra* helps to consume and assimilate *dhtitu-satvos* on being subjected to *śvedana* and *mārdana* etc. processes. In this way all the Salvos get liquified inside mercury by the effect of heat.

Vidyādhara Yantra



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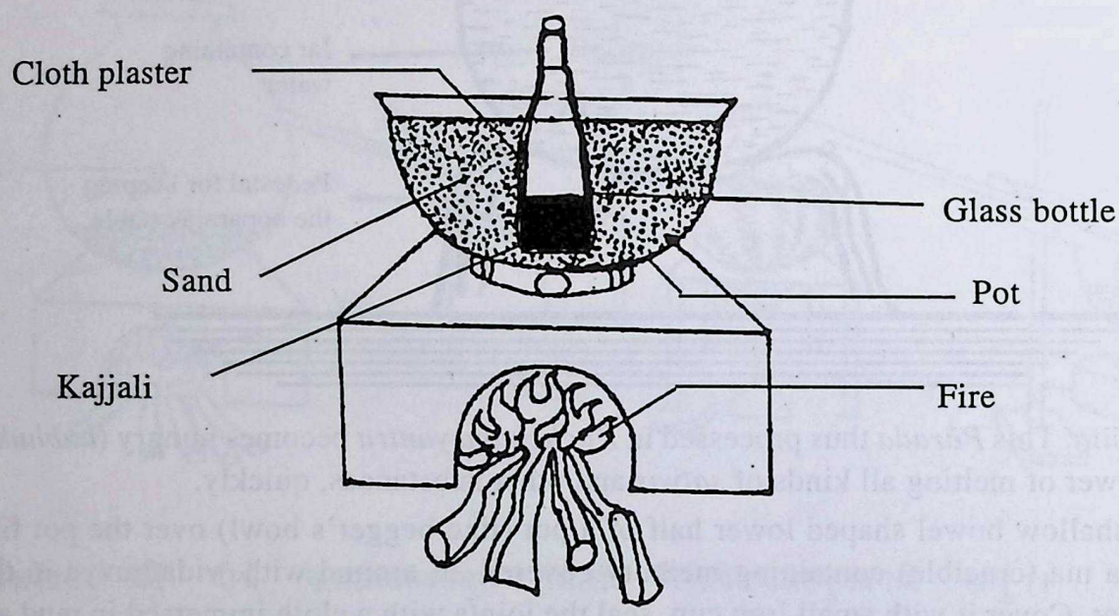
यन्त्रं विद्याधरं ज्ञेयं स्थालीद्वितयसम्पुटात् । चुल्ली चतुर्मुखीं कृत्वा यन्त्रभांण्डं निवेशयेत् ।।
तत्रौषधं विनिक्षिप्य निरुन्ध्याद्भाण्डकांननम् । यन्त्रं विद्याधरं नाम तन्त्रज्ञैः परिकीर्तितम् ।। (र.र.स.९/२७-२८)

A *saṁpuṭa* which is prepared by joining two vessels is called *Vidyadhara Yantra*. To use this *Yantra* a suitable stove is constructed in accordance with the size and shape of the vessels. Actually a vessel is kept on the stove and another vessel is placed upon that, the joints being sealed. This *Yantra* is named by the scholars of *Rasatantra*, as *Vidyādhara Yantra*.

Vāluka Yantra



सरसां गूढवक्त्रां मृद्वस्त्रागंगुलघनावृताम् । शोषितां काचकलशीं त्रिषु भागेषु पूरयेत् ।।
भाण्डे वितस्तिगम्भीरे वालुकासु प्रतिष्ठिताम् । तद्भाण्डं पुरयेत्रिभिरन्याभिरवगुण्ठयेत् ।।
भाण्डवक्त्रं मणिकया सन्धिं लिम्पेन्मृदा पचेत् । चुल्ल्यां तृणस्य चादाहान्मणिकापृष्ठवर्तिनः ।
एतद्धि वालुकायन्त्रं तद्यन्त्रं लवणाश्रयम् ।।
पंचाढवालुकापूर्णभांण्डे निक्षिप्य यत्नतः । पच्यते रसगोलाद्यं वालुकायन्त्रमीरितम् ।। (र.र.स.९/३६-३९)

A strong (elongated) bottle, the mouth of which is constricted a little, is taken and covered one inch with muddy cloth (leaving the mouth and neck portions). After drying, *Pārada* with drugs, is filled 3/4 in this battle. A large earthern tub is taken and filled with sand in the midst of which, the above bottle is buried, leaving the neck portion above. Then a *Śarāva* is covered upon the mouth of the tube and joints sealed. The apparatus is placed upon the fire and heat is given in the order of mild, medium and intensive. The heating is continued until the dried grass which is kept on the *Śarāva* is burnt by heat. Such an apparatus is called *Valūka Yantra*. If, instead of sand, salt is used in this, it is known as *Lavaṇa Yantra*.

In total, 5 adhaka (1 adhaka=250 toal-2.75 kg.) of sand is to be taken in the above tub, in the midst of which the bottle or crucible containing *Pārada*, kept with other drugs, is placed.

[This is a most important and widely used apparatus for making *Kūpīpakva rasāyanas* and *Rasa Bhasma* etc. preparations. It is described in *Rasendra Cūḍāmaṇi, Rasa Ratna Samuccaya* and

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Rasakāmadhenu. It is also known as *Sikatā Yantra.* Because in this apparatus heat is being applied to the preparation through *Vālukā/Sikatā* (Sand) hence, it is named as *Vālukā* or *Sikatā yantra.* The idea of applying heat through *Vālukā* was probably to give uniform heating from all sides throughout the process. Various types of pots for filling *Vālukā* and various types of fuel and furnaces have been found mentioned for this purpose. But, here two main principles are seemed involved, viz.

i. Application of Uniform heating.

ii. Application of graded heating i.e. slow, medium and strong heating serially. That means initially there should be slow heat then it may be raised to medium heat and finally to strong heat. Generally *Kāca Kalaśa* or *Kūpī* is used for keeping medicines in this apparatus but sometimes *saṃpuṭa* or *Mūṣā* may also be used for keeping medicines.

In literature three/four types of descriptions of *Vālukā Yantra* are available. All mention about some important points i.e. either about the measurement of *bhāṇḍa* used for filling *Vālukā, kāca kūpī* or its position, or the quantity of *Vālukā,* and mode of applying heat to the *yantra.* Hence, if all are put together then that makes the ideal *Vālukā Yantra* description complete.

Description of Vālukā Yantra

Make a pit on the earth, prepare a *koṣthī* (furnace) over it having many holes in its lower portion. Now take a *bhāṇḍa* or *sthalī* made of soil having a hole of first finger size at its centre. The size of the *bhāṇḍa* should be selected as per the size of *kācakalaśī.* Fill the sand in it upto its neck. This is known as *Saikata Yantra.*

For this *yantra kācakūpī* of the 7 *angula* size may be taken and should be wraped with cloth smeared in mud all around in the thickness of one *angula* and dry it. Now a days seven layers of cloth smeared in mud are applied on the glass bottle and dried. Now fill $^1/_3$ part of the *kūpī* with the material to be heated and put a cork on its mouth and place the *kūpī* in the *bhāṇḍa* containing *Vālukā* or *lavaṇa* in its lower part. It should be placed in the middle of the *bhāṇḍa* containing *Vālukā* or *lavaṇa* in its lower part. It should be placed in the middle of the *bhāṇḍa* and the *bhāṇḍa* be filled with remaining portion of *bālukā.* Cover it with a *māṇikā* (earthern lid) on its upper side and seal it with mud. It should then be heated from below till the dried grass put on *māṇikā* starts to burn. This is known as *Vālukā Yantra.*

According to the text the height of the *bhāṇḍa* should be of one *vitasti* 9''. The breadth of the *bhāṇḍa* should be as much that may accommodate five *aḍhakas* (20 *prasthas*) of *Vālukā* in it. It may be used for preparing *Rasa Bhasma, Rasa Sindūra* and other *bhasma Sindūra Kalpas* and also for making *Jāraṇa.* As regards the heating time and schedule texts advised to heat it continuously for 3, 4, 5 or even 6 days.

Vālukā Yantra currently in use

1. The *Vālukā Yantra* which is in use at present is not covered and sealed with *māṇikā* (earthern lid).

2. If earthern *bhāṇḍa* is used for filling *Vālukā* then it should contain a big hole in the middle of the bottom portion and as per tradition an *abhraka patra* (mica sheet) is put on the hole to prevent *Vālukā* from falling down, and at least some sand is put at the bottom of the *bhāṇḍa* and the *kūpī* is placed.

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3. Now a days earthen *bhāṇḍa* is replaced with iron pot at many places and in that case bottom hole is not required and the size of the pot may also be made smaller.

4. Instead of firewood, hard coak furnace is being used in many places.

5. Total heat period is divided in three phases i.e. initially or in first phase slow heat is applied then in second phase medium heat is applied and in third phase strong heat is applied. Now, question is that how it can be decided. One way for this may be by measuring the temperature and another way may be by seeing the changes that are taking place in the product. In ancient times there were no methods for measuring the temperature hence during that time it might have been determined by seeing the changes only though it is not clearly mentioned. The author has tried to determine these phases as follows on the basis of changes and experiences.

In case of *Kūpīpakava Rasāyanas* we may consider the limit of *mṛdu agni* (mild heat) till the *kajjali* mixture melts and fumes may starts to come out. From temperature measurement point of view its maximum limit may be taken as the two hundred degree centigrade (200^{0}C). It is the observation that till 200^{0}C temperature is reached the *kajjali* mixture of almost all the preparations is found melted and fumes may start coming out of the bottle mouth. It should be allowed to take one third part of the total time prescribed.

The limit of *madhyama agni* (medium heat) is till the boiling of the melted *kajjali* mixture and coming out of sulphur fumes profusely to burn extra sulphur and to change the materials into desired compounds due to the effect of chemical reactions taking place during heating. Here maintaining of boiling of the product is important. From temperature point of view boiling of the product and profuse fuming between 350^{0}C to 400^{0}C, Temperature. For this also $^1/_3{}^{rd}$ part of the total period should be allowed to be consumed. During this period sudden rise of temperature should not be allowed as by this sometimes boiling liquid may outburst or comes out of the bottle and the neck of the bottle should not be allowed to be obstructed by the condensed fumes and for this hot iron rod should frequently be inserted into the bottle mouth and neck to clean the neck from the deposited fumes. During this phase a cold iron rod if inserted in the bottle the boiling liquid will stick to it and may give an impression of liquidity of the mixture and even of boiling.

The limit of *tivrāgni* (strong heat) may be the disappearance of flame from the bottle mouth and bright redness of the bottom of the bottle. From temperature point of view it may be above 400^{0}C and between 400^0 to 500^{0}C. The strong heat is essential for burning extra Surphur from the product and converting the black compound into the red compound. Without raising the temp. above 400^{0}C flame would not appear at the bottle mouth and then burning of extra sulphur may take much longer time hence when two third part of total period is passed and still extra sulphur remains present in the bottle then in the last phase strong heat is applied to burn extra sulphur quickly and to convert the product into red compound. Then after corking the mouth properly the red compound is allowed to sublime and to get deposited at the neck of the bottle. Some Scholars advised strong heating for one or two hours more after corking for getting the product to be sublimed, but as per the experience it is not necessary.

Modification in the Kūpīpāka Method

Generally *Kūpīpāka* preparations are prepared by using *Bālukā yantra* till now. But, it has modified this method by introducing the use of vertical type electric muffle furnace for this purpose and

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deleting the use of *Bālukā yantra*. The principle of using *Bālukā yantra* for this preparation was to apply uniform heating to the *kūpī* containing the materials. And by using the electric furnace heating this uniformity of temp. Can be maintained even without using *Bālukā yantra*. Further, in electric furnace heating the temp. controlling facilities prove greatly helpful in controlling and maintaining temp. at any particular point without any difficulty. The only thing required in furnace heating is a prior standardisation of the temp. of *mṛdu, madhya* and *tīyrāgni* heat which could be done easily by the signs mentioned for the preparations, and once the standardisation of temp. of different heat is done, then that may be followed for further heatings without any problem.

On the basis of the signs and the experience the temp. limit of *mṛdu agni* has been fixed to 200°C and of *madhyamāgni* to 350°C to 400°C and for *tīvrāgni* it is over 400°C and upto 500°C to 600°C. It is the experience of the Prof. D. Joshi that if the above temp. schedule is followed almost all the *Kūpīpakva Rasāyanas* could be prepared without any problem. The duration for *mṛdu, madhya* and *tībrāgni* may be adjusted as per the contents and their quantity.

This modification in the method of *kūpīpakva* preparation is working very satisfactory and with full success. The advantages of this method of heating is that by this method no *kūpī* has so far been found broken or damaged due to heat. The product could also be prepared quickly as there is no chance of heat loss rather total heat is being consumed in this method of preparation. It does not require an all time presence of attendant as continuous fueling is not required here which was essential in the case of firewood or even hard coak furnace heatings.

Lavaṇa Yantra

एवं लवणनिक्षेपात्प्रोक्तं लवणयन्त्रकम् ।। (र.र.स. ९/४०)

If the salt, instead of sand is used in the *Vāluka yantra*, then it is called *Lavaṇa Yantra*.

Lavaṇa Yantra II

अन्तःकृतरसालेपताम्रपात्रमुखस्य च । लिप्तवा मृल्लवणेनैव सन्धिं भांण्डतलस्य च ।।
तद्भाण्डं पटुनाऽपूर्य क्षारैर्वा पूर्ववत्पचेत् । एवं लवणयन्त्रं स्याद्रसकर्मणि शस्यते ।। (र.र.स.९/४१-४२)

Pārada with other drugs is smeared inside a copper vessel and the vessel placed upside down in another big wide vessel and joining parts are well sealed with the help of paste prepared by clay and salt water. The salt or alkali (*kṣāra*) is filled in the big vessel and heated on the fire, as in the process of *Valūka Yantra*. This apparatus is called *Lavaṇa Yantra*, which is considered to be very useful in mercurial operations.

Nalika Yantra

लोहनालगतं सूतं भाण्डे लवणपूरिते । निरूद्धं विपचेत्प्राग्वन्नलिकायन्त्रमीरितम् ।। (र.र.स. ९/४३)

A cylindrical iron tube is filled with *Pārada* and other drugs, and closed either way. Then it is buried inside the *lavaṇa* (salt) taken in a vessel and heated. This *yantra* is named as *Nalika Yantra*.

Bhūdhara Yantra

वालुकागूढसर्वांगां गर्ते मूषां रसान्विताम् । दीप्तोत्पलैः संवृणुयाद्यन्त्रं तद् भेधरांह्वयम् ।। (र.र.स. ९/४४)

A pit is dug in the earth and sand is spread in it. Then the crucible, which contains *Pārada* along

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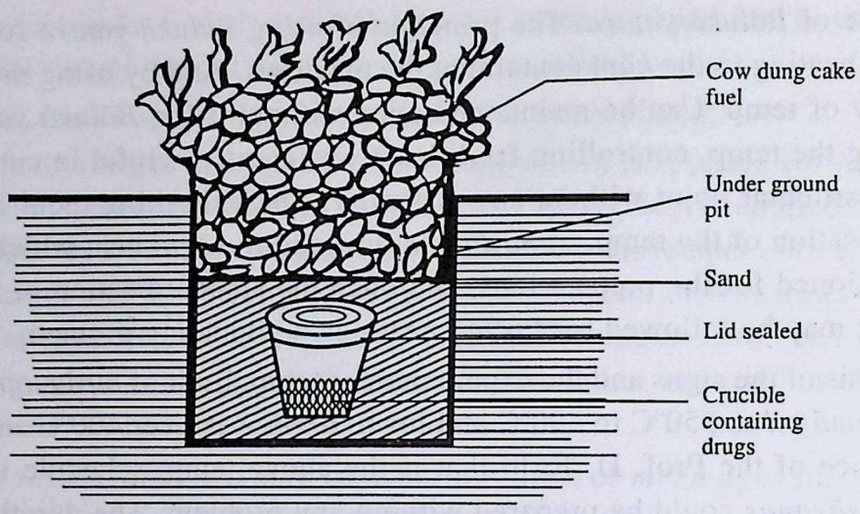


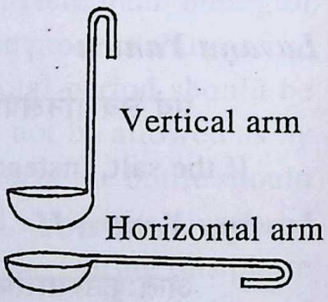
with drugs and mouth sealed, kept in this pit. Sand is spread all over and the cowdung cakes are placed upon it and ignited. This *Yantra* is called *Bhūdhara Yantra*.

Another Procedure : In an earthen vessel having open mouth, one inch of sand should be kept. Over this sand, the crucible containing mercury should be kept. All around this crucible one inch of sand should be spread. Over it, cow-dung cakes should be kept. These cow-dung cakes should be ingnited. This is called *Bhūdhara yantra.*

Palīka Yantra

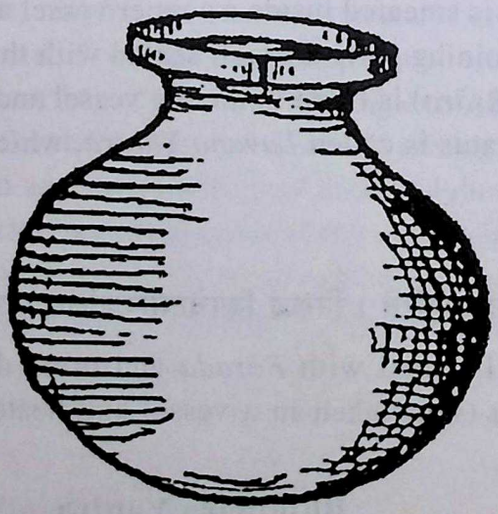
चषकं वर्तुलं लोह विनताग्रोर्ध्वदण्डकम् । एतद्धि पालिकायन्त्रं बलिजारणहेतवे ।।

(र.र.स. ९/५०)



A *chaṣaka* (cup or a small concave vessel) of iron is fixed with a rod and the other end of the rod is bent outside. This *Yantra* is known as *Palika Yantra*, which is useful in the *Jāraṇa of Gandhaka.*

Ghaṭa Yantra



चतुष्प्रस्थजलाधारश्चतुरंगुलिकाऽननः । घटयन्त्रमिदं प्रोक्तं तदाप्यायनकं स्मृतम् ।। (र.र.स. ९/५१)

A pot which can contain 4 *prastha* (256 tola-about 3 liters) of water and having 4 *angula* wide

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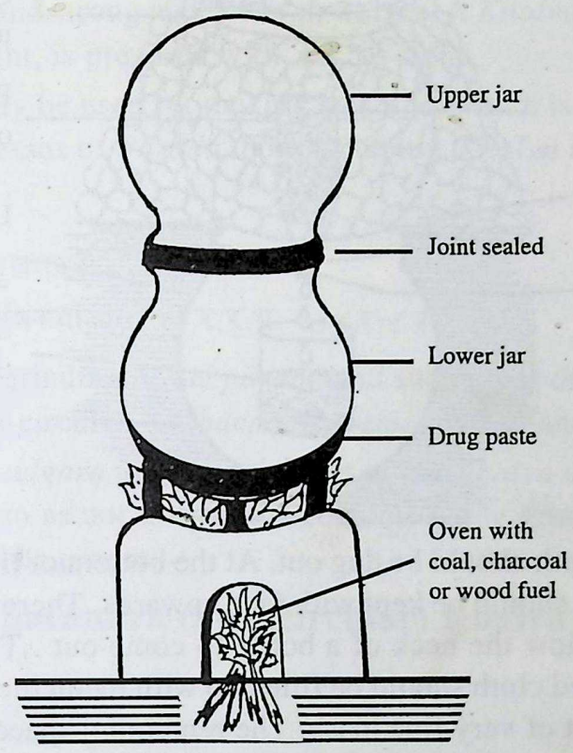
mouth is called *Ghaṭa Yantra* or *Āpyāyana Yantra* (which nourishes the *Pārada*).

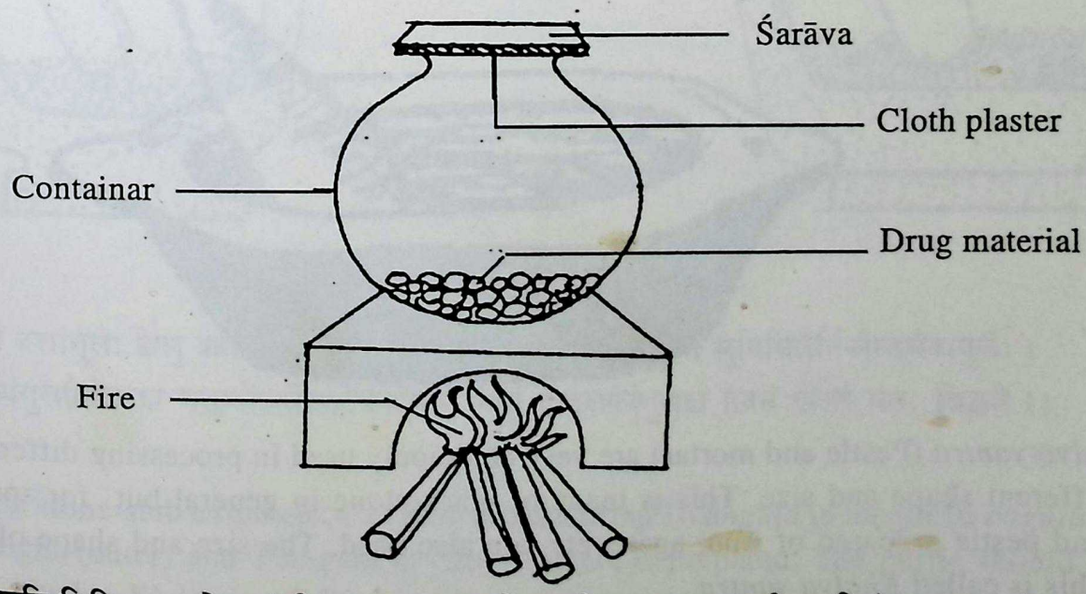
Damaru Yantra



यन्त्रस्थाल्युपरि स्थाली न्युब्जां दत्वा निरुन्धयेत् । यन्त्रं डमरुकारव्यं तद्रसभस्मकृते हितम् ।। (र.र.स.९/५८)

Two earthen vessels are joined at their mouth portions and sealed properly with clayed cloth. It is known as *Damaru yantra*, used for the preparation of *Bhasma* of *Pārada*.

Sthāli Yantra



स्थाल्यां ताम्रादि निक्षिप्य मल्लेनास्यं निरुद्धय च । पच्यते स्थालिकाधस्तात्स्थालीयन्त्रमिदं स्मृतम् ।।(र.र.स. ९/६७)

The minerals like *Tāmra* (copper), taken along with different drugs are placed in an earthen vessel and covered with a *śarāva*, sealed and heated on the stove. It is known as *Sthāli Yantra*.

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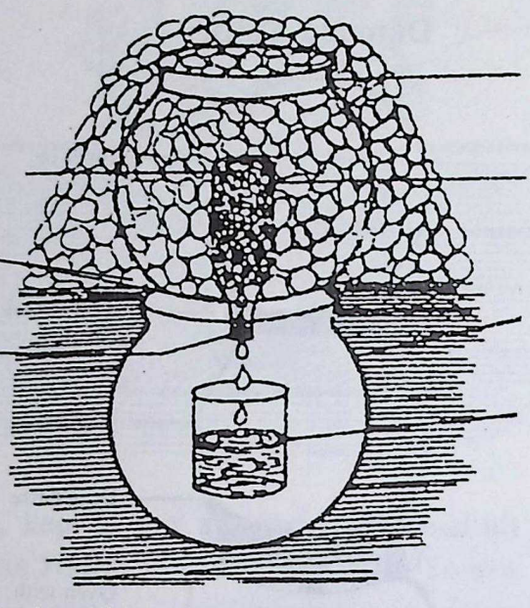
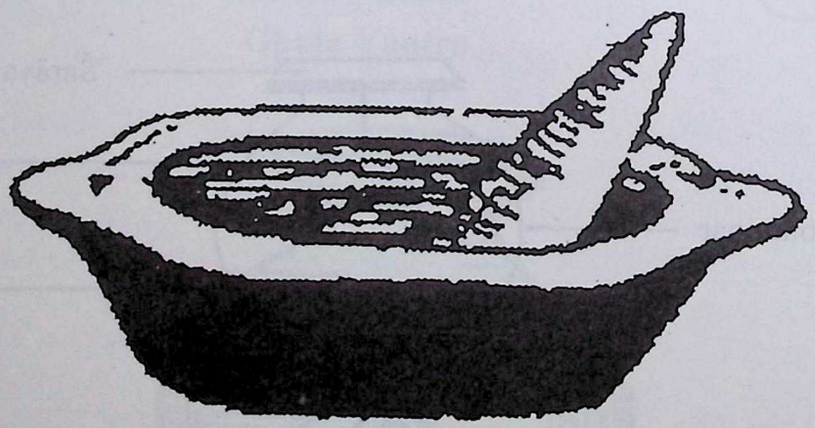
Pātāla Yantra



A pit of about 2" in depth should be dug out. At the bottom of this pit, a pot should be kept. Over this pot another earthen pot should be kept with face upwards. There should be a hole at the bottom of the upper earthen Pot to allow the neck of a bottle to come out . The bottle which is wrapped with seven layers of mud-smeared cloth should be filled up with medicine and its mouth should be covered with the help of an iron net of very fine mesh. The remaining space over the upper vessel should be filled up with charcoal and ignited. Because of this heat, the oil of the ingredients inside the bottle will start exudating and gradually through the iron net this oil will trickle down to the vessel kept at the bottom of the pit. It can be used even for preparing oil from some oil seeds like *bhallataka* (Semecarpus anacardium Linn. f.) This is called *Pātāla Yantra.*

Khalva Yantra



Khalva yantra (Pestle and mortar) are very commonly used in processing different drugs. They are of different shape and size. This is made of black stone in general but for specific purposes, mortar and pestle prepared of iron, agate, etc. are also used. The size and shape of the pestle also varies. This is called *Khalva yantra.*

खल्वयोग्या शिला नीला श्यामा स्निग्धा दृढा गुरुः । षोडशांगुलकोत्सेधा नवांगुलकविस्तरा ।।
चतुर्विशांगुला दीर्घा घर्षणी द्वादशांगुला । विशत्यंगलुदीर्घा वा स्यादुत्सेधे दशांगुला ।।

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खल्लप्रमाणं तज्ज्ञेयं श्रेष्ठं स्याद्रसकर्मणि ।। र.र.स. ९/७८-८०

The stone which is used for making the *Khalva* (mortar and pestle) should have blue or light black in colour, smooth to touch and strong and heavy in weight. A *Khalva* measuring 24 *angula* long, 9 *angula* wide and 16 *angula* hight, is prepared with such a stone.

The similar kind of stone may be used for making a *khalva,* which is 20 *angula* in length and 16 *angula* in width. In various processes of *Pārada,* both the above *Khalva* are said to be best.

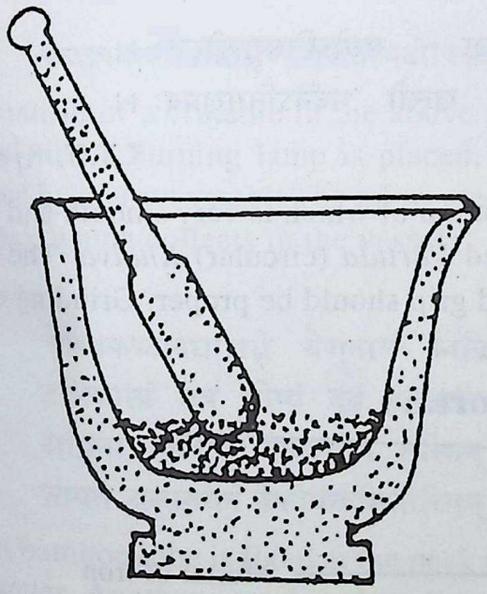
Varities of Khalva

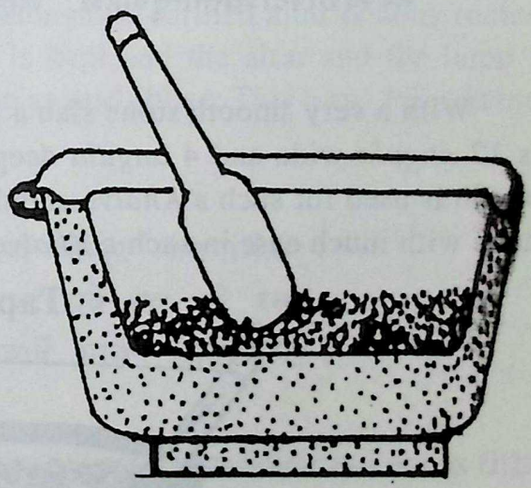
खल्लयंत्र त्रिधा प्रोक्तं रसादिसुखमर्दने ।।
निरुद्गारौ सुमसृणौ कार्यौ पुत्रिकया युतौ ।। र.र.स. ९/८१-८२

In order to facilitate proper grinding of the *pārada* and such other drugs, three types of *khalvas* have been mentioned i.e. Vartula-circular, *Ardhacandra-Semi* circular and *Taptakhalva*-heated.

Khalva should be devoid of *udgara* i.e. the inner part of the *Khalva* should be devoid of any ups and downs or curves and twists so as not to spill the contents while grinding and should have even surface. *Mardaka* (pestle) should be proper.

Ardhacandra (Semicircular) Khalva





उत्सेधे स दशांगुलः खलु कलातुल्यांगुलायामवान् विस्तारेण दशांगुलो मुनिमितैर्निम्नैस्तथैवांगुलैः ।
पाल्यां द्वयंगुलविस्तरश्च मसृणोऽतीवार्द्धचन्द्रोपमो घर्षो द्वादशकांगुलश्च तदयं खल्लं मतः सिद्धये ।।

र.र.स. ९/८३

With an even stone-slab a semicircular *Khalva* measuring 16 *angula* in length 16 *angula* in width 10 *angula* in height (outer) and 7 *angula* in depth (inner) is prepared. The pestle should be of 12 *anguli* in length. Such a *Khalva* is said to be very useful.

अस्मिन्पंचपलः सूतो मर्दनीयो विशुद्धये । तत्तदौचित्ययोगेन खल्लेष्वन्येषु योजयेत् ।। र.र.स. ९/८४

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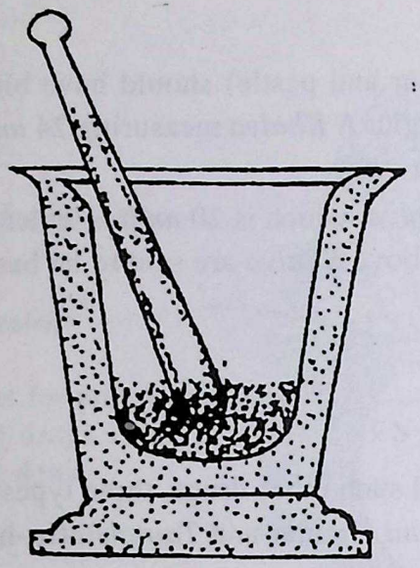
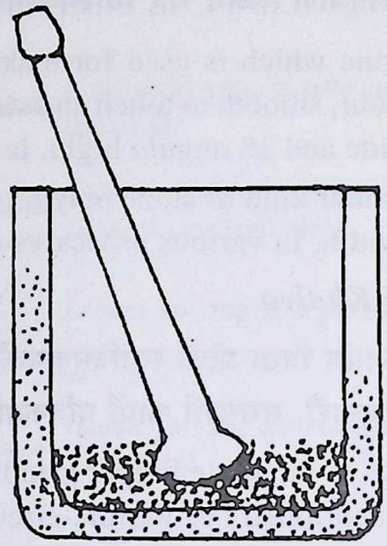




In such a *Khalva* 5 *pala* (20 tola = 240 gms) of *pārada* is ground, for performing a special kind of *śodhana*. For various operations and processes, according to the quantity of *pārada, Khalvas* of different size are made use of.

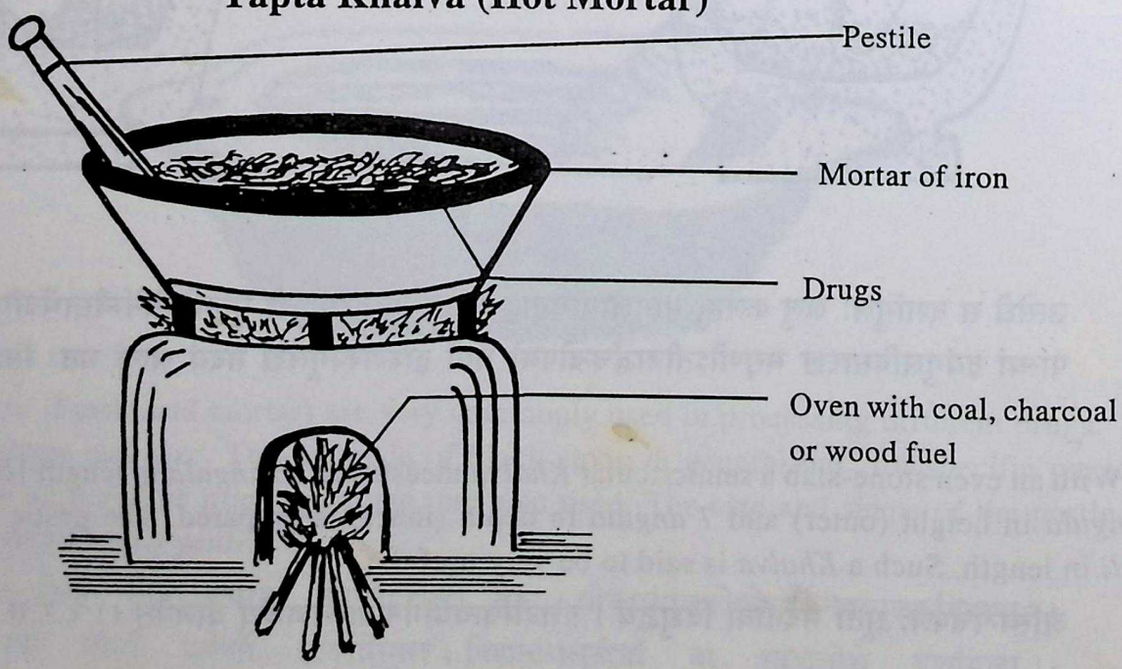
Vartula (Circular) Khalva

द्वादशांगुलविस्तारः खल्लोऽतिमसृणोपलः । चतुरंगुलनिम्नश्च मध्येऽतिमसृणीकृतः ।।
मर्दकश्चिपिटोऽधस्तात्सुग्राहश्च शिखोपरि । अयं तु वर्तलः खल्लो मर्दनेऽतिसुखप्रदः ।।

र.र.स. ९/८५-८६

With a very smooth stone slab a *Khalva* is made, the bottom of which is very smooth and which is 12 *angula* wide and 4 *angula* deep. This *Khalva* is called *Vartula* (circular) *Khalva.* The pestle which is used for such a *Khalva* should have flat bottom and grip should be proper. Grinding can be done with much ease in such a *Khalva.*

Tapta Khalva (Hot Mortar)



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लौहो नवांगुलः खल्लो निम्नत्वे च षडंगुलः । मर्दकोऽष्टांगुलश्चैव तप्तखल्लभिधोऽप्ययम् ।। र.र.स. ९/८७

At times, the mortar during the preparation of the medicine has to be kept over fire, Since stone mortars will not be able to stand the effect of the heat and is likely to crack, usually for this purpose iron mortar and pestle are used. This is called *Tapta Khalva yantra.* Tapta Khalva is prepared by iron (or metal) and measures 9 *anglua* in width and 6 *angula* in depth. The pestle is 8 *angula* long.

Kaṇḍūka Yantra

स्थूलस्थाल्यां जलं क्षिप्त्वा वासो बध्वा मुखेहढम् । तत्र स्वेद्यं विनिक्षिप्य तन्मुखं प्रपिधाय च ।।
अधस्ताज्ज्ववालयेदग्निं यन्त्रं तत्कन्दुकाभिधम् । स्वेदनीयन्त्रमित्यन्ये प्राहुश्चेदं मनीषिणः ।।
यद्वा स्थाल्यां जलं क्षिप्त्वा तृणं क्षिप्त्वा मुखोपरि । स्वेद्यद्रव्यं परिक्षिप्य पिधानं प्रपिधाय च ।।
अधस्ताज्वालयेदग्निं यन्त्रं तत्कन्दुकं स्मृतम् ।। (र.र.स.९/७५-७७)

Half of a big *Sthāli* (vessel) is filled with water and its mouth is covered with a strong cloth and tied. The medicinal substances which are to undergo the process of *Śwedana* is spread upon this cloth and the vessel is covered with another similar shaped vessel so that the mouths of these two are joined properly. After sealing the apparatus is placed upon fire. It is called *Kaṇḍūka Yantra* otherwise known as *Śwedani yantra.* Instead of covering the vessel with cloth, dry grass is filled in its mouth, and the medicinal substances are placed upon this grass and heated. This too can be called *Kaṇḍūka Yantra*

Dīpika Yantra

कच्छपयन्त्रान्तर्गतमृण्मयपीठस्थदीपिकासंस्थः । कस्मिन्निपतति सूतः प्रोक्तं तद्दीपिकायन्त्रम् ।। (र.र.स. ९/१६)

Instead of a crucible in the above *Kachchapa yantra* an elongated earthen altar is constructed, upon which a burning lamp is placed. In this lamp, *Pārada* is kept and the altar and the lamp is covered by an iron vessel. The joints are sealed and heat is given as said above. This turns *Pārada* into *Bhasma*, which collects in the vessel.

Deki Yantra

भाण्डकण्ठादधश्चिध्रे वेणुनालं विनिक्षिपेत् । कांस्यपात्रद्वयं कृत्वा सम्पुटं जलगर्भितम् ।।
नलिकास्यं तत्र योग्यं दृढं तच्चापि कारयेत् । युक्तद्रव्यैर्विनिक्षिप्तः पूर्वे तत्र घटे रसः ।।
अग्निना तापितो नालात्तोये तस्मिन् पतत्यधः । यावदुष्णं भवेत्सर्वे भाजनं तावदेव हि ।
जायते रससन्धानं डेकीयन्त्रमितीरितम् ।। (र.र.स. ९/१७-१९)

A bamboo tube is fixed at the neck part of a vessel. Two bronze vessels are taken and one is filled with water. Another vessel is placed upon the first, upside down and the joints is cemented to prepare a *saṁpuṭa*. Another end of the above tube is connected to the upper vessel of the *saṁpuṭa* and connecting parts of the tube are also sealed. *Pārada* and the other substances are placed in the first vessel and heated intensively. The *Pārada* due to heat, sublimes and collects in the *saṁpuṭa*. *Pārada* continues to collect in the *saṁpuṭa* until the vessel remains hot. This instruments is called *Deki Yantra*.

Jāraṇa Yantra

लोहमूषाद्वयं कृत्वा द्वादशांगुलमानतः । इषच्छिद्रान्वितामेकां तत्र गन्धकसंयुताम् ।।
मूषायां रसयुक्तायामन्यस्यां तां प्रवेशयेत् । तोयं स्यात्सूतकस्याध ऊर्ध्वाधो वन्हिदीपनम् ।।
रसोनकरसं भद्रे यत्रतो वस्त्रगालितम् । दापयेत्प्रचुरं यत्रादाप्लाव्य रसगन्धकौ ।।
सलिकायां पिधायोर्ध्वं स्थालीमान्यां दृढां कुरु । सन्धि विलेपयेद्यत्रान्मृदा वस्त्रेण चैव हि ।।

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स्थाल्यन्तरे कपोताख्यं पुटं कर्षाग्निमेव सदा । यन्त्रस्याधः करीषाग्निं दद्यत्तिव्राग्निमेव वा ।।
एवं तु त्रिदिनं कुर्यात्ततो यन्त्रं विमोचयेत् । तप्तोदके तप्तचुल्ल्यां न कुर्याच्छीतलां क्रियाम् ।।
न तत्र क्षीयते सूतो न च गच्छति कुत्रचित् । अनेन च क्रमेणैव कुर्याद्गन्धकजारणम् ।। (र.र.स.९/२०-२६)

Two iron vessels, with 12 anguli diameter are taken. One is filled with *Pārada* and another with *Gandhaka*. Both are added with juice of *Lasuna*. A small hole is made at the bottom of the vessel containing *Gandhaka* and it is placed upon the vessel containing *Pārada*. These two are kept inside a big water container so that the vessel containing *Pārada* submerges half in the water. Mouth of this container is closed with another vessel and the joints are sealed. The powder of cowdung cake equal to the amount needed for *Kapota pūṭa* is taken in this upper vessel. Then the whole apparatus is kept on the stove. Thus the fire is ignited from above as well as below and heat is given for three days. Afterwards the apparatus is dismantled. However it is not done so until the water in the container remains hot as well as the fire is still burning. At the same time, fire is not extinguished by sprinkling cold water. Only after selfcooling, the *Pārada* is taken out. This restricts the loss of *Pārada*. This *Yantra* which is called *Jāraṇa Yantra* is used for the *Jāraṇa* of *Gandhaka*, in the way described above.

Śomanāla Yantra

ऊर्ध्वे वन्हिरधश्चापो मध्ये तु रससंग्रहः । सोमानलमिदं प्रोक्तं जारयेद्गनादिकम् ।। (र.र.स. ९/२९)

An apparatus is constructed in which the fire is above the *Yantra,* water is below and the *Pārada* along with medicinal substances, is in the middle. This *Yantra* is called *Śomanāla Yantra*. It is useful in the *Jāraṇa* of *Abhraka* and such other substances.

Garbha Yantra

गर्भयन्त्रं प्रवक्ष्यामि पिष्टिकाभस्मकारकम् । चतुरंगुलदीर्घा च ह्यंगुलोन्मितविस्तराम् ।।
मृण्मयी सुदृढां मूषां वर्तुलं कारयेन्मुखम् । लवणादविंशतिर्भागा भाग एकस्तु गुग्गुलोः ।।
सुश्लक्षणं पेषयित्वा तु वारं वारं पुनः पुनः । मूषालेपं दृढं कृत्वा लवणार्धमृदंबुभिः ।।
कर्षेत्तुषाग्निना भूमौ स्वेदयेन्मृदु मानवित् । अहोरात्रं त्रिरात्रं वा रसेन्द्रो भस्मतां व्रजेत् ।। (र.र.स.९/३०-३३)

Now, the *Garbhayantra* which is useful in the preparation of *Piṣṭi* of *Pārada* (or preparing *Bhasma* after *Piṣṭi*) as well as the *bhasma* of various other minerals, is described.

A strong *mūṣa* (crucible) measuring 4 *angula* in length and 3 *angula* in breadth, is prepared with the help of mud. The outer surface of this crucible is then smeared with the *piṣṭi*, prepared by 20 parts of *Śaindhāva lavaṇa* (Rock salt), one part of *Guggulu* and 10 parts of mud. When dried up, once again, another layer of this paste is smeared so that the crucible becomes more strong. Then, *Tuṣa* (paddy husk) is filled in a small pit in the earth and this crucible in which *Pārada Piṣṭi* is kept, is placed and mild fire is given. *Pārada Bhasma* is obtained by heating this for 24 hours or 3 days.

Haṁsapāka Yantra

खर्परं सिकतापूर्णे कृत्वा तस्योपरि न्यसेत् । अपरं खर्परं तत्र शनैर्मृद्वग्निना पचेत् ।।
पंचक्षारैस्तथा मूत्रैर्लवणंच विड़ं तथा । हंसपाकं समाख्यातं यन्त्रं तद्वार्तिकोत्तमैः ।। (र.र.स.९/३४-३५)

A large *Kharpara* (Couldron) is filled with sand and another smaller vessel is kept. In this, *pañcakṣāra* (5 alkalies prepared by *Palāśa*, *Muṣkaka*, *Yava*, *Śwarjika* and *Tila*), *Aṣṭamūtra* urines of buffallo, goat, sheep, camel, cow donkey, elephant and horse) and *Pañca lavaṇa* (5 salts called

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Souvarcāla, *Śaindhava*, *Biḍa*, *Audibhida* and *Sāmudra*) are taken and heated to prepare the *Biḍa*. The *Rasaśiddhas* has called this as *Haṁsapāka Yantra*.

Valabhi Yantra

यत्रलोहमये पात्रे पार्श्वयोर्वलयद्वयम् । तादृक् स्वल्पतरं पात्रं वलयप्रोतकोष्ठकम् ।।
पूर्वपात्रोपरि न्यस्य स्वल्पपात्रे परिक्षिपेत् । रसं सम्मूर्छितं स्थूलपात्रमापूर्य कांजिकैः ।।
द्वियामं स्वेदयेदेवं रसोत्थापनहेतवे । एतत्स्याद्वलभीयन्त्रं रसे षाडगुण्यकारकम् ।।
सूक्ष्मकान्तमये पात्रे रसः स्यादगुणवत्तरः । (र.र.स. ९/४७-४९)

A big iron vessel is taken, to the neck portion of which, two iron rings at the opposite ends are fixed. Another smaller iron vessel (the diameter of the body being smaller but that of mouth is similar), is also furnished with two rings. *Mūrchhita Pārada* is taken in this vessel and it is inserted into the first vessel containing *Kāñji* (certain portion of the small vessel should be immersed in the *Kāñji*). The rings of two vessels are then tied together and the apparatus is kept on fire. If heated for two *prahara* (6 hours), the *Pārada* becomes richer by six qualities (*vidya, vitarka, vijñāna, tatparata, smṛti* and *kriyas* are six qualities). This apparatus is called *Valabhi Yantra*. It can render more beneficial qualities to *Pārada*, if this *yantra* is constructed with *Kāntaloha* (magnetic iron), instead of mere iron.

Iṣṭika Yantra

विधाय वर्तुलं गर्तं मल्लमत्र निधाय च । विनिधायेष्टिकां तत्र मध्यगर्तवतीं शुभाम् ।।
गर्तस्य परितः कुर्यात्पालिकामंगुलोच्छ्रयाम् । गर्ते सूतं विनिक्षिप्य गर्तास्ये वसनं क्षिपेत् ।।
निक्षिपेदगन्धकं तत्र मल्लोनाऽस्य निरुद्ध्य च । मल्लपालिकायोर्मध्ये मृदा सम्यङ्निरुध्य च ।।
वनोत्पलैः पुटं देयं कपोताख्यं न चाधिकम् । इष्टिकायन्त्रमेतत्स्याद्गन्धकं तेन जारयेत् ।। (र.र.स.९/५२-५५)

A round pit is dug in the earth and a *Śarāva* is placed inside it. Then a brick which has a hole in the middle, is kept over the *Śarāva*. A *pali* (cylindrical erection) is constructed with clay around that hole on the surface of the brick. *Pārada* is put inside the hole and a cloth is spread upon the *palī*. *Gandhaka* is spread on the cloth and a *Śarava* is placed properly so that it is adjusted to the rim of the *pali* and joints are sealed. On the concave surface of the *Śarāva*, cowdung cakes equal to the numbers needed for *Kapota pūṭa* are placed and ignited and heat is given. It is called *Iṣṭika Yantra* and is useful in *Gandhaka Jāraṇa*.

Hingulakṛṣṭi Vidyādhara Yantra

स्थालिकोपरि विन्यस्य स्थाली सम्यङ्निरुध्य च । ऊर्ध्वस्थाल्यां जलं क्षिप्त्वा वन्हिं प्रज्वालयेदयः ।।
एतद्विद्याधरं यन्त्रं हिंगुलाकृष्टि हेतवे ।। (र.र.स.९/५६-६७)

A vessel (inside which *Hingula* is smeared) is taken and another vessel is placed (mouth upwards) upon it and filled with water. The joining portions of the vessels are cemented. This *Yantra* is then placed upon fire and heated. It is called *Vidyadhara Yantra* which is used for extracting *Pārada* from the *Hingula*.

Nābhi Yantra

मल्लमध्ये चरेद्गर्तं तत्र सूतं सगन्धकम् । गर्तस्य परितः कुडयं प्रकुर्यादंगुलोच्छ्रितम् ।।
ततश्चाऽच्छादयेत्सम्यग्गोस्तनाकारमूषया । सम्यक् तोयमृदा रुद्धा सम्यगत्रोच्यमानया ।।
ततो जलं विनिक्षिप्य वन्हिं प्रज्वालयेदधः । नाभियन्त्रमिदं प्रोक्तं नन्दिना सर्ववेदिना ।।

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अनेन जीर्यते सूतो निर्धूमः शुद्धगन्धकः ।। (र.र.स. ९/५९-६१)

A big *Śarāva* in the bottom of which, a concave pit is already existed, containing *Pārada* with *Gandhaka* is taken. A *Palī* (cylindrical erection) is constructed around this pit and dried. A *Gostani mūṣa* is placed upon the *palī* so that the *rims* of both *palī* and crucible are joined properly. This joint is then sealed properly with the help of *Toyamṛṭṭhika*. When it is dried up, the *Śarāva* is filled with water and placed upon the stove. This *yantra* which is described by a *Rasaśiddha Nandi*, is called *Nābhi yantra* and is useful in the *Nirdhūma* (smokeless) *Jāraṇa* process of *Pārada* and *gandhaka*.

Grasta Yantra

मूषा मूषोदराविष्टामाद्यन्तसमवर्तुलाम् ।
चिपिटां च तले प्रोक्तं ग्रस्तयन्त्रं मनीषिभिः ।।
सूतेन्द्ररन्धणार्थं हि रसविद्भिरुदीरितम् ।। (र.र.स. ९/६६)

A *mūṣa-crucible* is prepared, which is cylindrical, elongated and flat at the bottom. Another similar *mūṣa*, but little smaller in size (inside) is inserted (mouth first) into the bigger crucible and joints are sealed. This *yantra* is called *Grasta Yantra* and according to scholars it can be used in *Pācana* (or *bandhana*) of *Pārada*.

Dhūpa Yantra

विधायाष्टांगुलं पात्रं लौहमष्टांगुलोच्छ्यम । कण्ठाधो द्व्यगंले देशे गलधारे हि तत्र च ।।
तिर्यग्लोहषलाकास्च तन्वीस्तिर्याग्विनिक्षिपेत् । तनूनि स्वर्णपत्राणि तासामुपारि विन्यसेत् ।।
तत्राधो निक्षिपेद्धूमं वक्ष्यमाणीहैव हि । तत्पात्रं न्युब्जपात्रेण छादयेदपरेण हि ।।
मृदा विलिप्य सन्धिश्च वन्हि प्रज्वालयेदधः । तेन पत्राणि कृष्णानि हतान्युक्तविधानतः ।।
रसश्चरति वेगेन दुतं गर्भे द्रवन्ति च । धूपयन्त्रमिदं प्रोक्तं जारणाद्रव्यसाधने ।। (र.र.स.९/६८-७२)

An iron vessel measuring 8 *angula* long and equally wide, is taken and a *Galadhara* (pavement) is constructed around the area 2 *angula* below the mouth, inside the vessel. Iron rods are placed upon this pavement, horizontally and on this mesh of rods thin leaves of *swarṇa* are spread. The vessel should be filled beforehand with *Dhūpa dravya*, (fumigatory substance like *Gandhaka, Harātāla* etc). The mouth of the vessel is covered with another iron vessel, kept upside down, the joining portions sealed properly with clay. This *yantra* is then placed upon the fire and heated, by which the leaves of *Swarṇa* becomes black, which can be subjected to *Māraṇa* process, yielding the *Bhasma* quickly. *Pārada* can consume such leaves, readily and they disigntegrate in the midst of *Pārada* very quickly. This apparatus is called *Dhūpa yantra* which is useful for the preparation of materials used in the process of *Jāraṇa*.

Dhūpa Dravya (Fumigatory Substances)

गन्धकशिलानां हि कज्जल्या वा मृताहिना । धूपनं स्वर्णपत्राणां प्रथमं परिकीर्त्तितम् ।।
तारार्थं तारपत्राणि मृतवंगेन धूपयेत् । धूपयेच्च यथायोग्यैरन्धैरूपरसैरपि ।। (र.र.स.९/७३-७४)

The sheets of *Swarṇa* can be fumigated using the finely ground (like *kajjali*) mixture of *Gandhaka, Haratāla* and *Mananśila* or mere *Bhasma* of *Nāga* (lead). In *Tāra kārma* (The process of converting the lower metals into silver), for the fumigation of the sheets of silver, *Vaṅga Bhasma* is used. In this way various useful *Uparasa* (a group of minerals) are used for fumigation.

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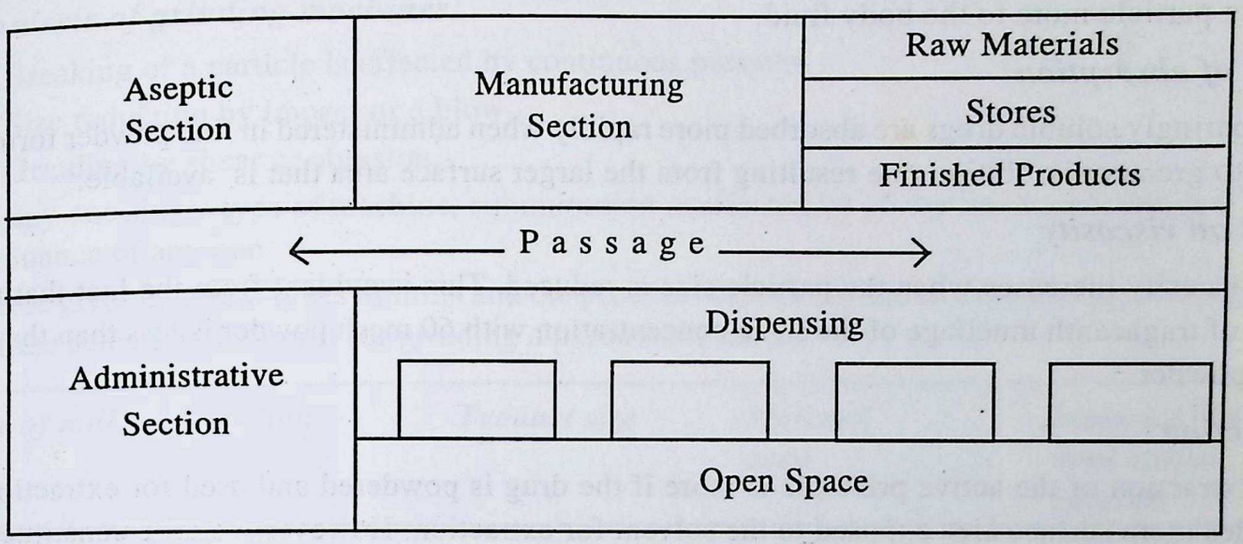
PLAN OF PHARMACY



According to modern Pharmaceutics, the Pharmacy should be constructed nearer to Hospital. The space and equipment required for the manufacture of pharmaceuticals depends on the number and type of products to be prepared and the processes involved in the production. Since each dosage from required specialized production equipment and techniques, there may be separate areas of production for tablets, capsules, liquids, ointments and parenteral preparations etc. In the manufacture of all sorts of preparations various steps are involved which required space and special equipment . The total pharmacy is planned in the form of square shape, it will be divided into two parts the space is allowed for the passage. In one part the total area is divided into three divisions, first division is meant for sterilization purpose which is called aseptic section. Second division contains different machines related with manufacturing of medicines. The next division is divided further into three parts, in one part raw material is stored, in second part the semi-processed raw materials will be stored and on the third part the finished products will be stored.

The Second major division of the pharmacy is again further divided into one small part and large part, in small part the administrative unit is arranged; the large part contains different types of counters meant for dispense different types of Medicines, this part also includes reception.

Importance of Size Reduction

The terms comminution, grinding, milling or particle size reduction are used for the processes, which break the bigger particles of substance into smaller particles. The pharmaceutical materials used for formulation and the preparation of dosage form are not always available in the required particle size. Hence, milling equipments are used to reduce particle size to the desired degree. In the case of extraction of crude drugs, such a particle size reduction process becomes necessary for complete exhaustion of the drug. There are variety of substances of different origin such as plant materials, animal materials or minerals which require particle size reduction. The degree of comminution depends on the type of active ingredient it contains and its use. Hence, milling is one of the important processes in pharmacy.

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Surface area

Particle size reduction increases the surface area of the substance. The increased surface exposes the drug particle more to the body fluid.

Effect of absorption

Sparingly soluble drugs are absorbed more rapidly when administered in fine powder forms. This is due to greater dissolution rate resulting from the larger surface area that is available.

Effect on viscosity

Viscosity increases when the particle size is reduced. This is evident from the fact that the viscosity of tragacanth mucilage of the same concentration with 60 mesh powder is less than that of 120 mesh powder.

Extraction

Extraction of the active principle is more if the drug is powdered and used for extraction. This provides more surface area exposed to the solvent for extraction. However, volatile constituents of a crude drug may be lost during the size reduction process.

Mixing

Fine particles give uniform mixing with a homogeneous mass. This assures a uniform dose of various constituents of the mixture.

Appearance

Milling of the ointments, pastes or creams g ive them a smooth appearance. It also stabilises the preparation.

Some other effects are seen when particle size of a material is reduced.

1. Powdered vegetable drugs sometimes show an increase in potency. It is due to the loss of inert components, which indirectly concentrate the active principle in the powder.

2. A volatile principle may get volatilized during the milling process. This is due to the more exposed surface area of the crude drug and also due to the increase in temperature during grinding. Therefore, drugs like clove, cardamom, caraway or cinnamon are not powdered to a very fine form.

3. Preservation of powdered drug may create a problem. This is so because the large surface area of the powder is exposed to the atmosphere. Oxidation of the active constituent by atmospheric oxygen or volatilisation, may occur. Hence, powdered drugs are stored in well closed containers in cool places.

Comminution machineries are developed for grinding on a large scale. The machines should possess the following characteristics.

1. Ease in maintenance.
2. High efficiency
3. Should be able to comminute a variety of substances
4. Should have less adjustments.
5. Continuous and batch operations should be Possible
6. High hopper or feeder capacity

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7. Dust free operation
8. Ease in dismantling.

Mechanisms of grinding machines

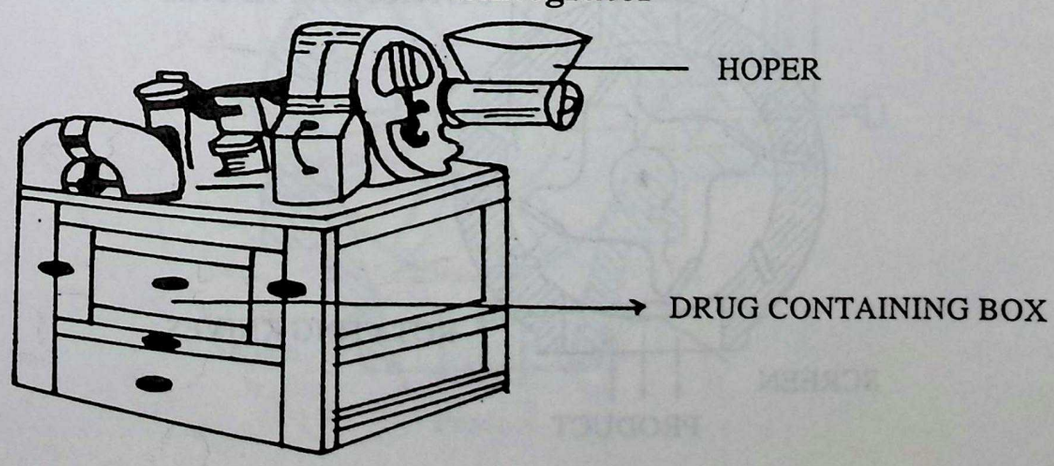
1. Breaking of a particle is effected by continuous pressure.
2. Size reduction by impact or a blow.
3. Grinding by shear or abrasion.

In any one single type of machine, comminution is effected by all the above mechanisms, with a predominance of any one.

Table gives different types of mills and the product obtained by them. This also provides a guide-line for the selection of a mill for grinding a particular product.

Type of mill	*Action*	*Product size*	*Material used*	*Material that used cannot be used*
Cutter	cutting	20 to 80 mesh	fibrous, crude animal and, vegetable drugs	Friable material
Revolving	attrition and impact	20 to 200 mesh	abrasive material	soft material
Hammer	impact	4 to 325 mesh	almost all	abrasive material
Roller	pressure	20 to 200 mesh	soft material	abrasive material
Attrition	attrition	20 to 200 mesh	soft anf fibrous	abrasive material
Fluid energy	attrition and impact	1 to 30 micron	moderately hardand friable	soft and sticky material
Pin mill	Impact	60 to 80 mesh	Hand material	Friable material
Toothed disc Mill	Friction and Shearing	20to 80mesh	Freeze dried procucts dry extracts	abrasive material
Blower mill micronizer	Impact	upto200mesh	Moderately hard	Sticky.

Disintegrator



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For large scale work, size reduction is carried out mostly by using different kinds of mills which have the capabilities of producing powders with wide range of particle size. Since different mills are used for mechanical size reduction hence this process is also known as milling.

Comminution machineries are developed for grinding on a large scale. The machines should possess the following characteristics.

1. Ease in maintenance
2. High efficiency
3. Should be able to comminuate a variety of substances.
4. Should have less adjustments
5. Continuous and batch operations should be possible
6. High hopper or feeder capacity

It works on the principle of impact and grinding.

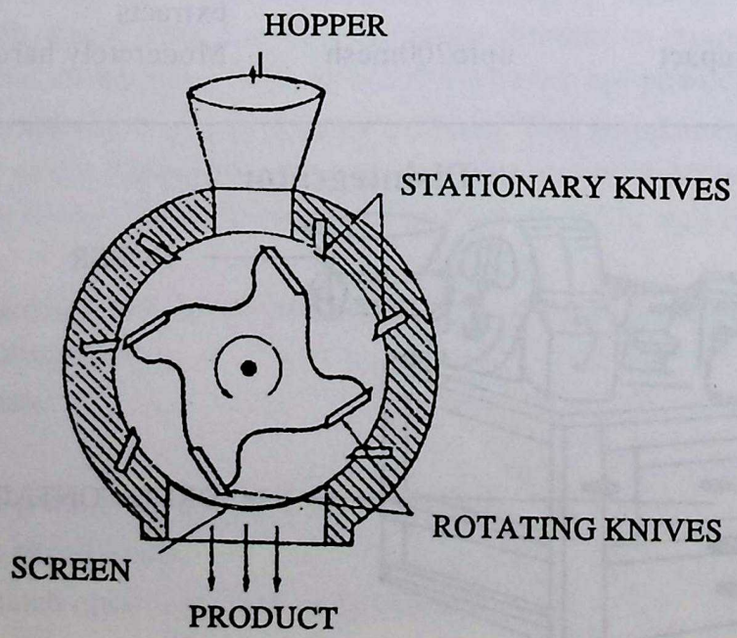
The disintegrator consists of a drum shaped chamber made of steel. In the chamber, there are four steel beaters fixed to a disc through which passes a shaft which rotates at a high speed upto 5000 to 7000 r.p.m. The lower part of the chamber is fitted with a desired number sieve which can be easily attached or detached. A hopper is attached at the upper surface of the chamber.

The drug to be comminuted is fed into the chamber through the hopper where it is broken by the direct blow of the beaters and by the impact of the material which is thrown with a great force against the surface of the chamber. The reduced particles pass through the sieve of desired size.

Now a days the disintegrators have become very popular because they can be used for reducing the particle size of all kinds of materials . It has got the following advantages :

1. They can be used for powdering very hard drugs but to avoid jamming of the beaters the drug in moderately small pieces and in dry conditions should be used.
2. They are used for powdering crude vegetable drugs.
3. They can be used for milling the ointments and for mixing the powdered ingredients.

Cutter Mill



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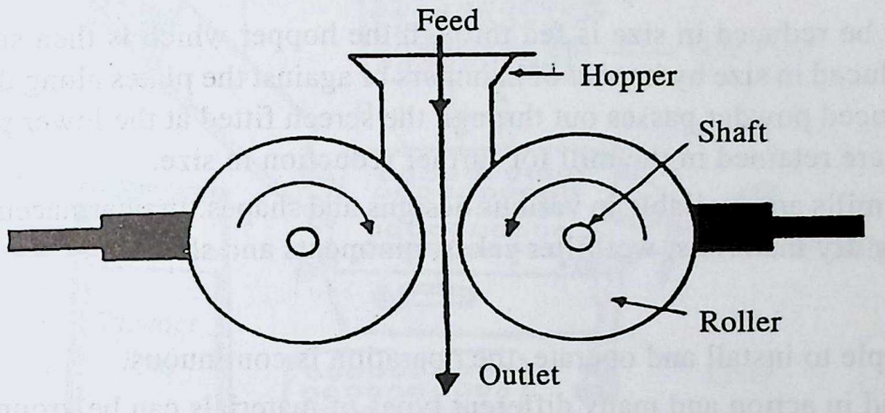
Cutter mill is fitted with two types of knives i.e. stationary and rotating. The stationary knives are mounted in the casing of the machine and rotating knives are attached to a rotor which rotates at high speed. The upper part is attached with a hopper and at the lower part of the machine a screen of desired size is attached.

The material to be reduced in size is put in the hopper and reduced material is collected from the screen. This method is used to obtain a coarse degree of size reduction of soft materials such as roots and peels before its extraction.

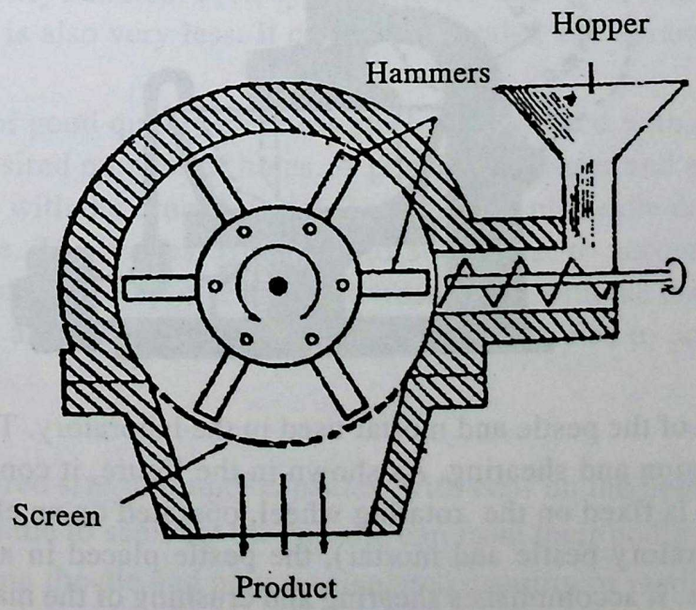
Roller Mill



Roller mill consists of two equal size rolls made up of stone or metal with an adjustable gap between them to control the size of the product. Generally one roll is driven mechanically whereas the other rotates free. The material to be bruised or crushed is dropped from a hopper into the gap. The speed with which the rollers rotate and the gap between the rollers determine the particle size of the material to be crushed , which can be adjusted easily. The rolls varying from a few centimeteres to a meter or more in diameter are available.

Roller mill is used for cracking the seeds before extraction of fixed oils or for bruising the soft tissues in order to help the menstruum to penertrate easily thus facilitating the extraction of active constituents.

Hammer Mill



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It works on the principle of impact.

The hammer mill consists of a steel casing in which is enclosed a central shaft to which a number of swinging hammers are attached. When the shaft is rotated the hammers swing out to a radial position. On the lower part of the casing a screen of desired size is fitted which can be easily replaced according to the particle size required. The construction of a hammer mill is almost similar to that of a disintegrator with the difference that in hammer mill the hammers are swinging in nature which are mounted with swivel joints and in disintegrator the beaters or hammers are fixed. These mills are provided with a fan and a cyclone for collecting the material when it has been reduced to the desired size.

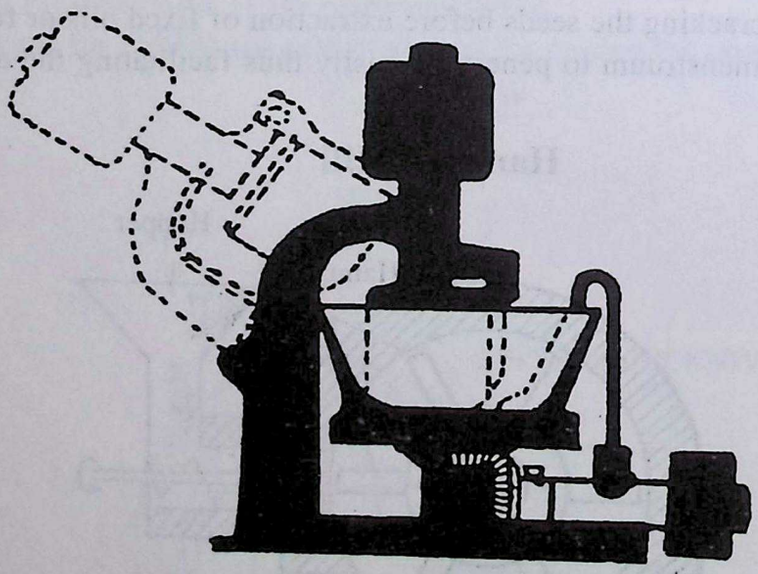
The material to be reduced in size is fed through the hopper which is then supplied to the mill centrifugally and reduced in size by impact of hammers or against the plates along the periphery of the mill casing. The reduced powder passes out through the screen fitted at the lower part of the mill and unreduced particles are retained in the mill for further reduction in size.

The hammer mills are available in various designs and shapes. In pharmaceutical industry they are used for grinding dry materials, wet filter cakes, ointments and slurries.

Advantages

1. They are simple to install and operate, the operation is continuous.
2. They are rapid in action and many different types of materials can be ground with them.
3. There are no chances of contamination due to abrasion of metal from the mill because no surfaces of the mill move against each other.
4. The particle size of the material to be reduced can be easily controlled by changing the speed of the rotor, hammer type, shape andsize of the screen.

End Runner Mill



It is modified form of the pestle and mortar used in the laboratory. This gives size reduction due to crushing by compression and shearing. As shown in the figure, it consists of a steel mortar and a steel pestle. The mortar is fixed on the rotating wheel, operated on an electric motor. As the mortar rotates (unlike the laboratory pestle and mortar), the pestle placed in an off centre position in the mortar also rotates. Thus, it accomplishes shearing and crushing of the material at the point of contact

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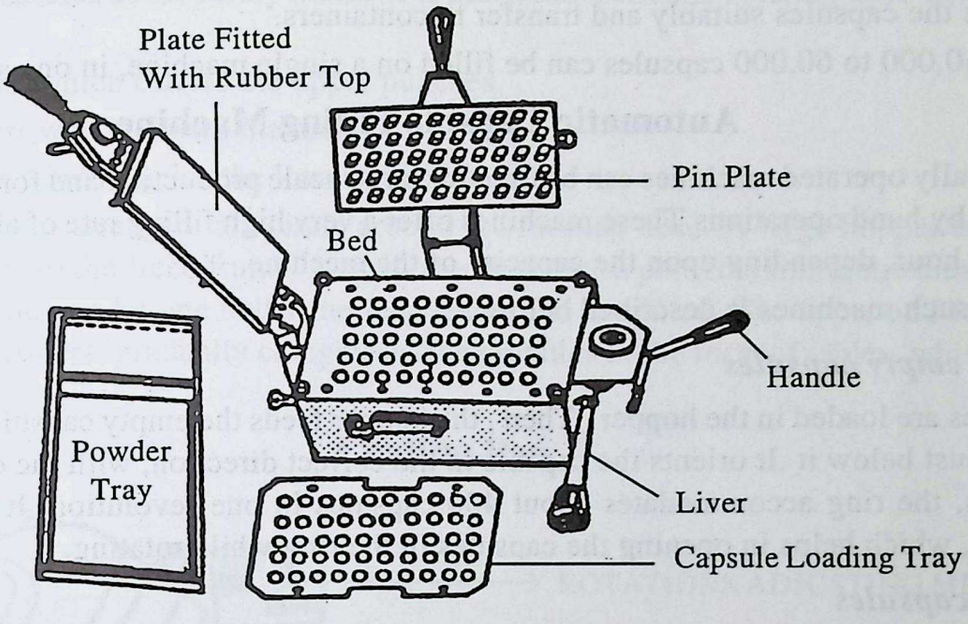
with the mortar. The material is continuously scraped and fed into the grinding path. This mill provides moderately fine powder and operates successfully with fibrous materials. Wet grinding, with very viscous material such as ointments, and paste, is also possible.

Capsule Filling Machine



Various types of capsule filling machines are available in the market. A machine is selected as per the requirements (hard capsule or soft capsule). The design and working of the machine varies, depending upon the type and quantity of capsules to be manufactured. Hand operated and electrically operated machines are available in India. Small scale manufactures use hand operated, semi-automatic machines. Complete automatic capsule filling machines are used in the large-scale production of capsules.

Hand operated capsule filling machine for hard gelatin capsules.

This machine can be easily handled, even by an unskilled worker. If it is used properly the rejection percentage of capsules is also very less. It can be dismantled and assembled easily. This facilitates easy cleaning.

The machine is made of good quality stainless steel and provided with a filling tray, fitting exactly on a die having the desired number of holes. A powder dispenser and a scoop is provided with the machine to fill the holes with the drug material. The capacity of the die depends on the number of capsules produced at a time. This varies, from 150 to 300 holes to accommodate the capsules of desired size. Different sets of dies and pin-sets are provided along with the machine, to fill the various sizes of capsules . Pin-sets are used to press the contents of capsules to accommodate the desired volume.

Operation

1. Fill the die with desired size of empty capsules, with caps on the upper side.
2. Operate the cam- handle to separate the capsule cap from their bodies.
3. Place a powder tray on the die and pour a calculated quantity of medicament into the tray.

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4. Using the scraper, distribute the powder completely in the capsules.
5. Then operate the pin-plate to compress the material in the capsule shells and refill the medicament if any space remains.
6. Operate the lever to lock the capsule cap on the body of the capsule.
7. Remove the loading tray and the capsules filled.
8. Clean the capsules suitably and transfer to containers.

About 40,000 to 60,000 capsules can be filled on a single machine, in one shift of eight hours.

Automatic Capsule Filling Machine

Electrically operated machines can be used for large-scale production and for medicaments which can be filled by hand operations.These machines offer a very high filling rate of about 2,000 to 25,000 capsules per hour, depending upon the capacity of the machine.

One of such machines is described below :

Loading of empty capsules

Capsules are loaded in the hopper . Then , the hopper feeds the empty capsules to the alluminium ring placed just below it .It orients the capsule in the correct direction, with the cap in one direction. As it rotates, the ring accommodates about 400 capsules in one revolution. It is connected to the vacuum line, which helps in opening the capsules in the ring while rotating.

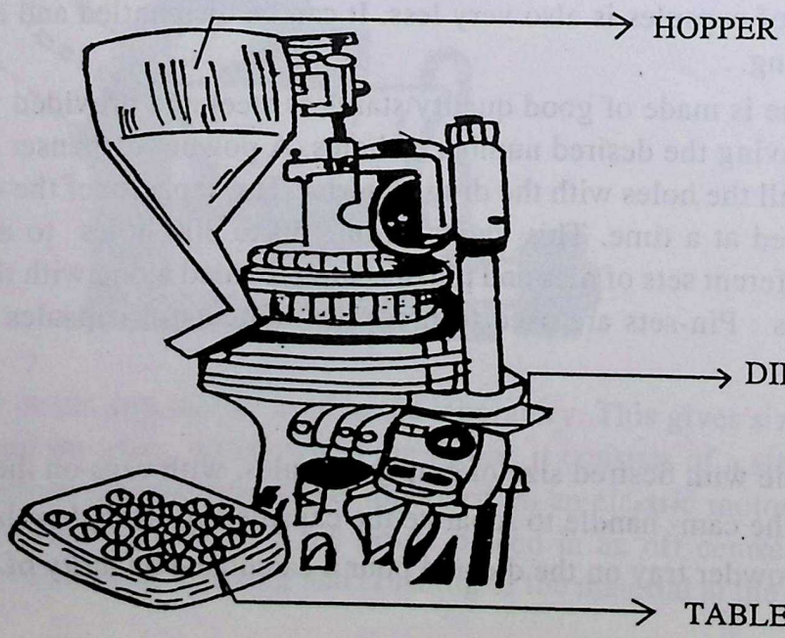
Filling the capsules

Medicament, with or without diluent is mixed in a tumbler mixer. The mixed mass is filled in the hopper provided with an auger arrangement. As the alluminium ring containing capsules rotates, forced delivery of the power using the auger is effected and the capsules get filled.

Closing of capsules

Caps which are removed at the first stage of the operation are placed over the body of the capsules. The correct closing of capsules with its cap is effected by the use of pegs, being operated pneumatically . The closed capsules are then ejected out from the alluminium ring.

Rotary Tablet Machine



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For large scale production, rotary tablet machines are used.The high speed rotary tablet machines are fitted with as many as 70 sets of dies and punches and can produce upto 10000 tablets per minute. The underlying principle of rotary tablet machine is that the dies and punches are mounted in a rotating holder (turrent) which passes them in sequence through the filling, compression and ejection stages at a much faster speed whereby the output is increased to a great extent.

The essential features of the rotary machine is that it has a circular rotating head which is devided into three parts:

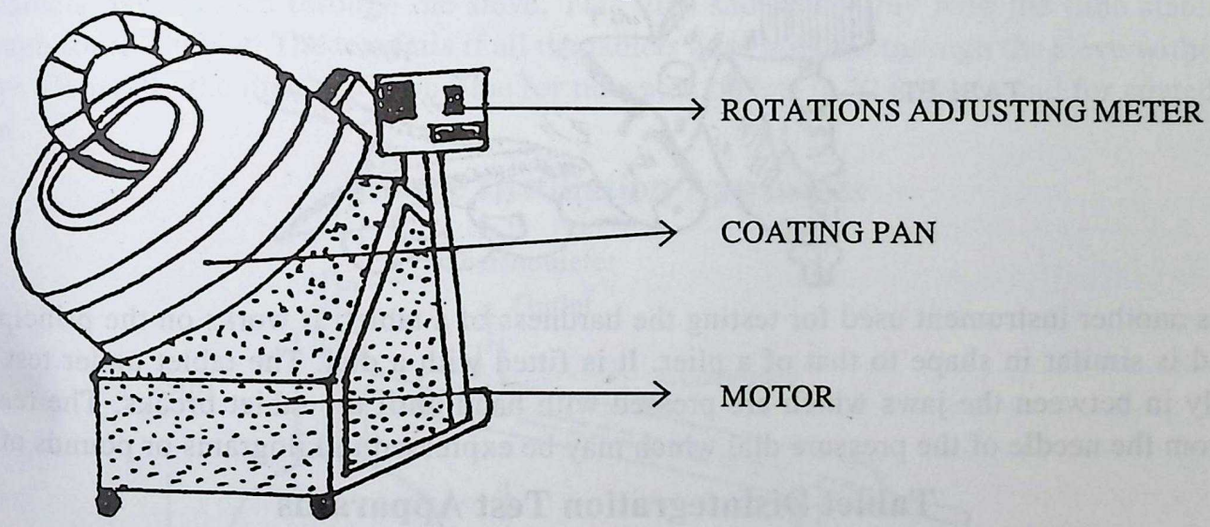
a. An upper part which carries the upper punches.

b. A central part which carries the dies.

c. A lower part which carries the lower punches.

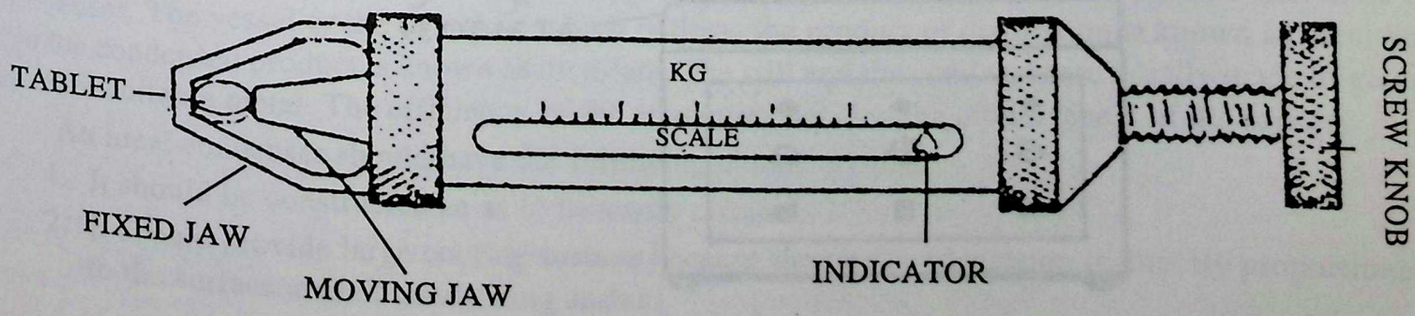
All these parts are arranged in a circle around the rotating head. A large hopper is fitted which supplies the granules to the 'feed frame' placed over the central part containing the dies. As the head rotates, the dies come one by one under the feed frame and are filled. The upper and lower punches passing in between rollers, gradually compresses the granules in the form of tablets which are pushed out.

Coating Pan



The coating pans are spherical vessels made of copper or stainless steel which rotate on the axis driven by a motor. The polishing pans consists of canvas drums which may be rotated on the same machine after removing the coating pan. The pans are fitted with air blowers to force hot or cold air to facilitate drying . They are also fitted with exhaust pipes to remove the unwanted dusting powders and moisture from the coating pans.

Monsanto Hardness Tester



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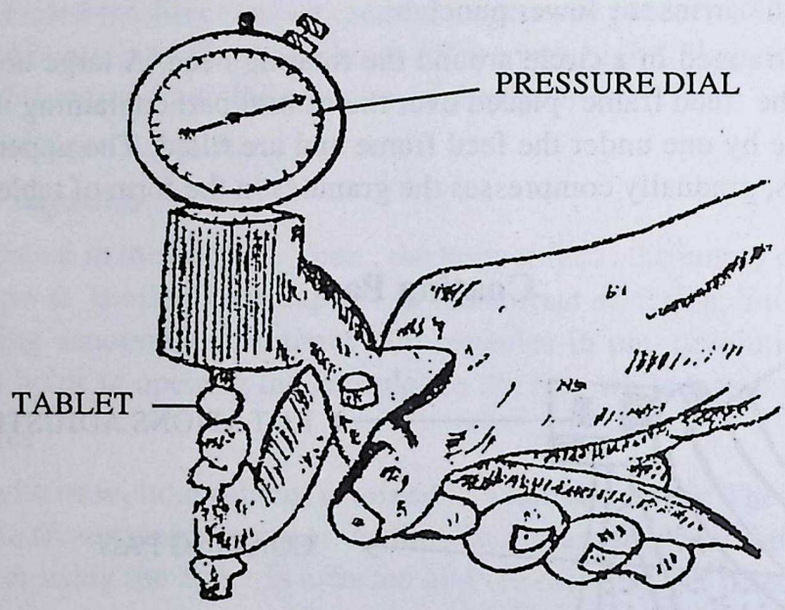
It is a small, portable hardness tester which was manufactured and introduced by Monsanto chemical company. It consists of a spring. Which can be compressed by moving the screw knob forward.

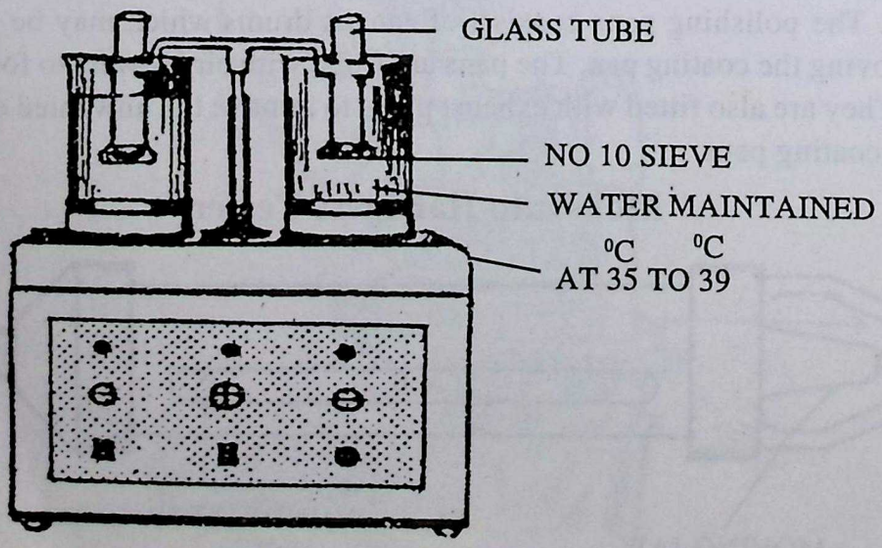
The tablet to be tested is held between a fixed and a moving jaw and reading of the indicator adjusted to zero. The force applied to the edge of the tablet is gradually increased by moving the screw knob forward until the tablet breaks. The reading is noted from the scale required in kgs or Ibs to break the tablet. Which indicates the pressure required in kgs or lbs to break the tablets. Hardness of 4 kg is considered suitable for handling the tablets. Hardness of 6 kg or more will produce tablets of highly compact natures.

Pfizer Tablet Hardness Tester



It is another instrument used for testing the hardness of a tablet. It works on the principle of a plier and is similar in shape to that of a plier. It is fitted with a dial. The tablet under test is held vertically in between the jaws which are pressed with hand until the tablet breaks. The reading is noted from the needle of the pressure dial which may be expressed in kilograms or pounds of force.

Tablet Disintegration Test Apparatus



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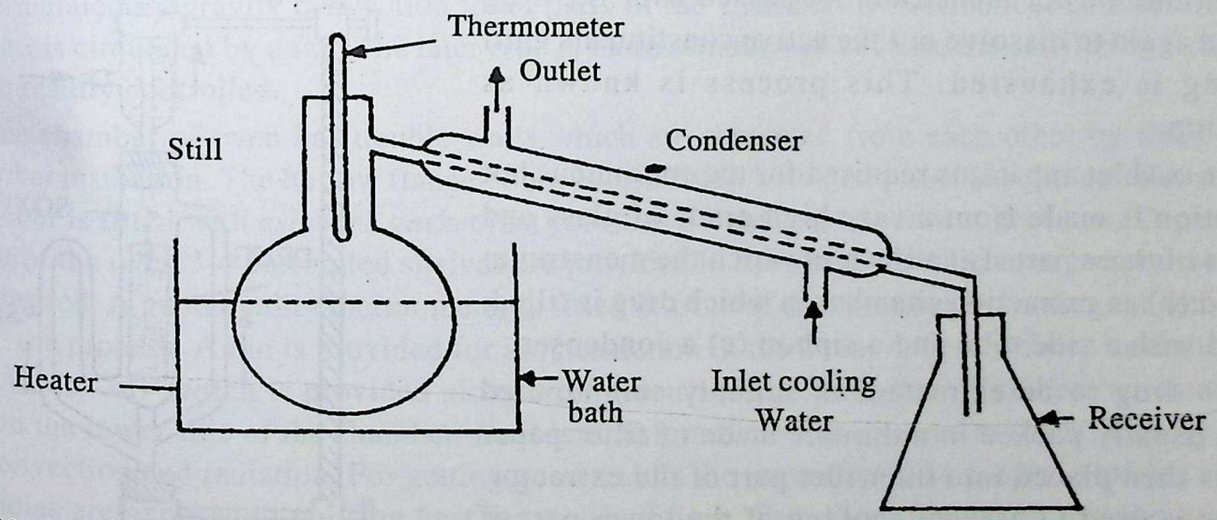
The disintegration test is performed to find out that within how much time the tablet disintegrates. This test is very important and necessary for all the tablets, coated or uncoated to be swallowed because the dissolution rate depends upon the time of disintegration which ultimately effects the rate of absorption of drugs.

The apparatus used for this test is known as disintegration test apparatus. This apparatus consists of a glass or plastic tube which is open at one end and the other end is fitted with a rust proof No.10 mesh sieve.

The tube is suspended in a bath of water or suitable liquid which is thermostatically maintained at a temperature of 37 oC . The tube is allowed to move up and down at a constant rate i.e. 30 times per minute through a distance of 75 mm. The volume of the liquid and distance of movement is adjusted in such a way that at the highest point the mesh screen just breaks the surface of the liquid to give a turbulent movement to the tablets and at the lowest point the mesh screen remains about 2.5 cm above the bottom of the container.

About five tablets are placed in the tube along with a plastic disk over the tablets unless otherwise stated in the monograph. The plastic disk does not allow the tablets to float and impart a slight pressure on the tablets. The tube is allowed to move up and down and disintegration time noted when all the tablets have passed through the sieve. This time should comply with the time stated in the monograph for that tablet. The test fails if all the tablets does not pass through the sieve within specified time. Generally the disintegration time for uncoated tablets is 30 minutes and for coated tablets one hour.

Simple Distillation Apparatus



The vessel or the container in which the process is carried out, or the substance is heated is known as still. The still is connected to a apparatus within which lies the cold surface, known as a condenser. The vessel or the container which collects the product of distillation is known as receiver and the condensed product is known as distillate. The still and the condenser are usually made of glass or other suitable metal. The efficiency of the condenser decided the effectiveness of the process.

An ideal condenser should have the following characteristics.

1. It should be constructed so as to be easily cleaned.
2. It should provide large cooling surface because the rate condensation is directly proportional to the surface area of condensing surfce.

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3. Condensing surface should be a good conductor of heat as the rapidity of condensation is proportional to the rate of conduction of heat.
4. The film of the condensed liquid should be easily removed or carried.
5. The water used for cooling the surface must have a good flow rate so as to provide good cooling surface.

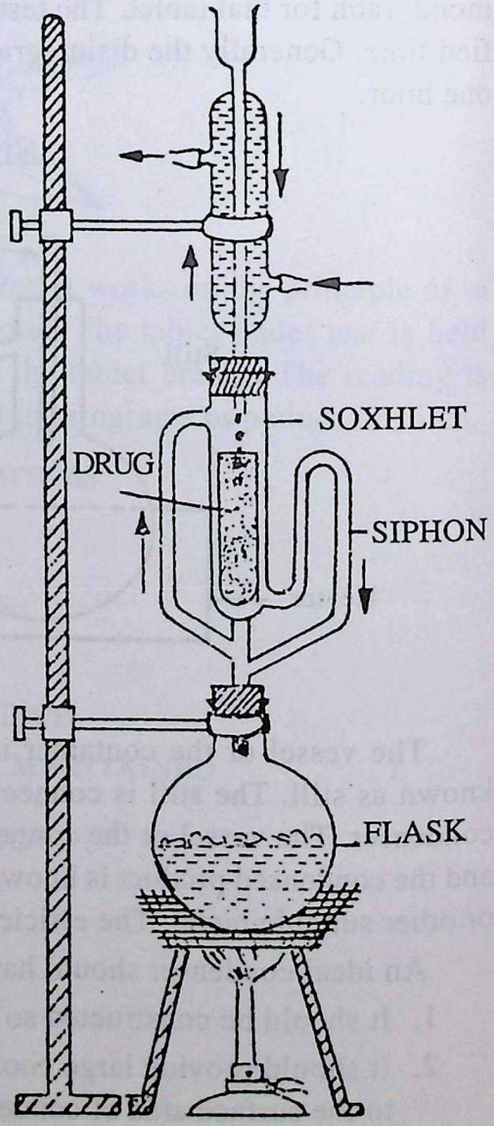
The various condensers for laboratory and commercial use include spiral condenser, bulb condenser, double surface condenser and multitubular condensers.

Simple distillation

It is the process of converting a liquid into its vapour, transferring the vapour to another place, and recovering the liquid by condensing the vapour, usually by leading it into contact with a cold surface. Simple distillation can produce partial separation of components with different boiling points in a liquid mixture, the more volatile component being obtained in increased concentration in the vapour. The process is generally used for the separation of liquids from non-volatile solids e.g. preparation of distilled water, and recovery of alcohol in the preparation of dry extracts.

Soxhlet Apparatus (Soxhlet Extraction)

Continuous hot percolation process is used for those drugs where the penetration of the menstruum into the cellular tissues is very slow and the solute is not readily soluble into the solvent and the quantity of menstruum is very less . In such cases Soxhlet extractor is used where small volune of hot menstruum is passed over the drug time and again to dissolve out the active constituents until the drug is exhausted. This process is known as soxhlation.



The soxhlet apparatus required for the continuous hot percolation is made from a very high grade of glass and consists of three parts (a) a flask in which the menstruum is boiled (b) an extraction chamber in which drug is filled, is fitted with a side tube and a siphon (c) a condenser.

The drug to be extracted, in suitably comminuted form is usually packed in a thimble made of filter paper which is then placed into the wider part of the extractor. Thimble is used to prevent choking of the lower part of the extractor by drug particles. Menstruum is placed in the flask and boiled, the vapours are allowed to pass through the side tube to the packed drug, through which it percolates and extratct out the active constituents. As the volume of menstruum in the extractor increases, the level of the liquid in the siphon also increases till it reaches the maximum point from where it is siphoned out into the flask. On further heating, the menstruum vaporizes while the dissolved active constituents remain be-

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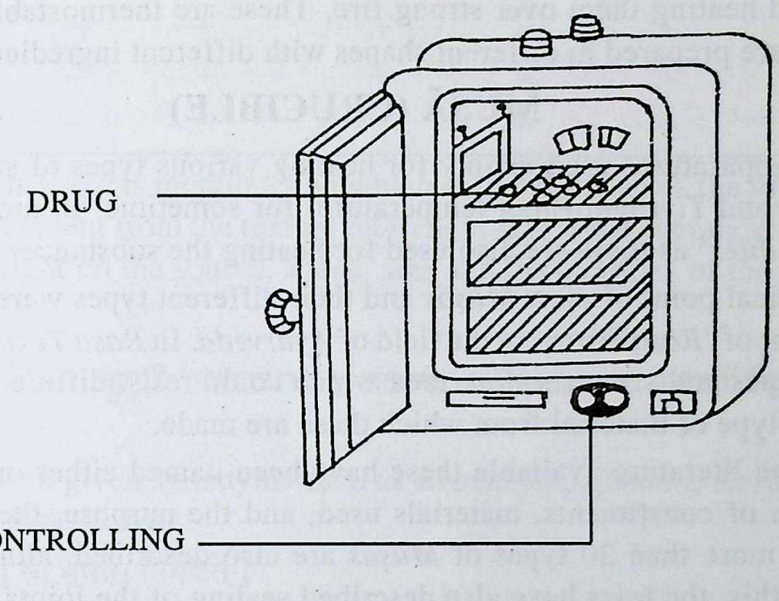
hind in the flask. The alternate filling and extractor goes on continuously till the drug is exhausted. Thus the same quantity of menstruum is made to percolate repeatedly, about 14 to 15 times through the drug and the active constituents are collected in the flask.

This process is not suitable for the drugs containing thermolabile active constituents.

Hot – Air Oven



Hot air oven or dry heat sterilizer consists of a metallic chamber of aluminium or stainless steel, which is electrically heated and thermostatically controlled . There are two types of ovens(1) in which air is circulated by gravity convection to all parts of the chamber(2) Mechanical convection type in which air is circulated by a fan. The later type is more satisfactory because the sterilizing temperature is more readily controlled.

The chamber of oven has double walls which are separated from each other by thick layer of glass-fiber insulation. The hollow flanged door is also filled with glass fiber insulation. The inner side of the door is fitted with *asbestos gasket* that provides a tight seal to prevent heat loss. Depending on the size of the oven 3-4 perforated shelves are provided in the chamber which can be removed as and when desired. A good quality thermometer is fitted in front of the chamber for noting the temperature during the process. A fan is provided for air circulation in the oven. A vent is fitted at the top of the oven. An on– off switch is provided along with green and red indicators. The heating elements are fitted on the lower side of the chamber. Heat is transferred from the source to the articles by conduction, convection and radiation. For getting good results the oven should be properly loaded so that all the articles are exposed to uniform heat for required time. Care should be taken that the oven is not opened in between the sterilization operation. Glass wares (thoroughly cleaned and dried) like conical flasks, test tubes, pipettes etc. should be plugged with non-absorbent cotton wool because absorbent cotton wool become saturated during sterilization and the plugs act as inefficient seals because the motile bacteria can swim through the attached moisture into the tubes.

In Rasa Śāstra and *Bhaiṣajya Kalpanā* several other equipments/machines are also used. Equipments/machines described above are only the commonly used ones.

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Chapter 4

MŪṢĀ, KOṢṬHĪ AND PUṬA

Some crucibles, ovens (fire place), *puṭas* and *yantras* (equipments) are specifically needed for the processing of metals and minerals. *Mūṣās* or crucibles are used for keeping metals, minerals, gems and jewels and heating them over strong fire. These are thermostable. Depending upon their requirements, these are prepared in different shapes with different ingredients.

MŪṢĀ (CRUCIBLE)

Mūṣas are the apparatuses used mainly for heating various types of substances in *Mṛdu* (low), *Madhya* (Moderate) and *Tivrāgni* (high temperature) for sometime. In modern terminology *Mūṣās* may be called *'Crucibles'* as these are also used for heating the substances at various temperature.

From the historical point of view *Mūṣās* and their different types were used and described only after the development of *'Rasaśāstra'* in the field of *Āyurveda.* In *Rasa Texts* different types of *Mūṣās* having different shapes and sizes are described which could resist different degrees of temperature depending upon the type of material from which these are made.

According to the literature available these have been named either on the basis of their form, their shape, the type of constituents, materials used, and the purpose, the uses for which they are prepared. And thus more than 20 types of *Mūṣās* are also described, along with other constituent materials. Not only this, the texts have also described sealing of the joints and sealing materials, so that these could be made very strong, heat proof and without the chance of any leakage.

Different authors have described different types of *Mūṣās* with some variation in description.

Table showing the different Mūsās according to different authors and their texts.

S.N.	Name of the *Mūṣa*	Name of the texts						
		1 Ras.	2 R.Cu.	3 R.P.S.	4 R.R.	5 R.R.S.	6 R.K.D.	7 R.T.
1	*Vajra Mūṣā*	+	+	+	+	+	–	–
2	*Gāra Mūṣā*	+	+	+	+	+	–	–
3	*Vara Mūṣā*	+	+	+	–	+	–	+
4	*Vajra Drāvaṇī Mūṣā*	–	+	–	–	+	–	+
5	*Varṇa Mūṣā*	–	+	+	–	+	–	–
6	*Andha Mūṣā*	+	–	–	–	–	+	–
7	*Raupya Mūṣā*	–	+	+	–	+	–	–
8	*Bhasma Mūṣā*	+	–	–	–	–	+	–
9	*Yoga Mūṣā*	–	–	+	–	+	–	–
10	*Prakāśa Mūṣā*	+	–	–	–	–	–	–
11	*Vṛntāka Mūṣā*	–	+	+	–	+	–	+
12	*Pakwa Mūṣā*	–	+	+	–	+	+	–
13	*Malla Mūṣā*	–	+	+	–	+	–	+
14	*Gola Mūṣā*	–	+	+	–	+	–	+
15	*Māha Mūṣā*	–	+	+	–	+	–	+

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16	*Maṇḍūka (Manjūsa)*	–	+	+	–	+	+	–
17	*Muśala Mūṣā*	–	+	+	–	+	–	–
18	*Dīrgha Mūṣā*	–	–	–	–	–	+	–
19	*Garbha Mūṣā*	–	–	+	–	–	–	–
20	*Suṣka Mūṣā*	–	–	–	–	–	+	–
21	*Gostanī Mūṣā*	–	+	+	–	+	–	+
22	*Viḍa Mūṣā*	–	+	+	–	+	–	–
23	*Prakaṭa Mūṣā*	–	–	+	–	–	–	–

This table shows that which *Mūṣā* is mentioned in which text and which of the *Mūṣā* are found commonly in all the texts. It is evident from the textual references that some synonyms have been used for *Mūṣās* which throw some light on the source, shape, size and the qualities of the *Mūṣās*.

Synonyms

मूषा हि क्रौञ्चिका प्रोक्ता कुमुदी करहाटिका। पाचनी वन्हिमित्रा च रसवादिभिरीर्यते।।

(र.र.स. १०/१)

Mūṣā (crucible) has been given synonyms such as *Krouncika, Kumudi, Karahāṭika, Pācani* and *Vahnimitra* by scholars of *Rasaśāstra*.

मुष्णाति दोषान्मूषेयान् सा मूषेति निगद्यते। (र.र.स. १०/२)

Mūṣā is called so, as it helps in cardicating the blemishes (from the mineral drugs.).

Krauncikā

As *Mūṣās* are usually made up of the soil obtained from *Krauñca* hill or as their shape resembles with the bird known as *Krauñca*. Hence these are known as *Krauñcikās*.

Karahāṭikā

As most of the *Mūṣās* are made up of the soil obtained from *Krahāṭa Deśa* (country) the synonym *Karahāṭikā* is given to them.

Kumudi

As the shape of many *Mūṣās* often resembles that of *Kumuda puṣpa* the synonym *Kumudī* is attributed to them.

Pācini

As almost all the *Mūṣās* are used for *Pācana* (heating) purposes hence they are also called *Pācinī*

Vahnimitrā

As almost all the *Mūṣās* generally 'Tolerate' strong heat and behave like a friend towards fire hence are called by the name *Vahni Mitrā*.

Mūṣā

As the removable *Doṣas* (impurities) of the substances are removed through the *Mūṣās* the term *Mūṣā* is used for such apparatuses.

Materials Needed For Making Mūṣās

According to the textual descriptions the following basic materials are needed for making the various *Mūṣās* described in the various texts.

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1. *Dagha tuṣa* (Burnt husk), 2. *Dagdha Vastra* (Burnt cloth), 3. *Balmīka Mṛttikā* (Hillock soil), 4. *Angāra* (Burnt charcoal), 5. *Purāṇa lohakitta* (Old iron slag), 6. *Swetāśma* (white stones), 7. *Dagdhagāra* (burnt clay) 8. *Dagdha Balmīka Mṛttikā* (Burnt Hillock Soil), 9. *Dagdha Gajamala* (burnt elephant dung), 10. *Dagdhaśwamala* (burnt horse dung), 11. *Kṛṣṇa Mṛttikā* (Black soil), 12. *Nara keśa* (Mans hair), 13. *Bhūnāga satwa* (metallic extract of earth worms), 14. *Śaṇa* (jute), 15. *Kūpī cūrṇa* (glass bottle powder), 16. *Sukti cūrṇa* (powder of Marine shell), 17. *Iṣṭikā cūrṇa* (Brick powder), 18. *Viḍa lavaṇa* (a type of salt), 19. *Vajra vallī* (a herbal drug), 20. *Jala* (water), 21. *Chāgī dugdha* (goats milk), 22. *Mahiṣī kṣīra* (buffalo milk), 23. *Balā rasa* (sida cardifolia juice), 24. *Matkuṇa Śoṇita* (blood of bed bugs), 25. *Pāṣāṇa cūrṇa* (stone powder), 26. *Bhūnāgamṛttikā* (earth worm soil), 27. *Rakta mṛttikā* (red soil), 28. *Rakta vargā cūrṇa* (powder of red group of drugs), 29. *Rakta varga rasa* (juice of red group of drugs), 30. *Tuvari* (alum) and 31. *Puṣpakāsīsa* (white ferrous sulphate).

Of the above materials, which have been mentioned for making *Mūṣās* some are of herbal nature, some are of mineral nature and some belong to the soil group. The soils are the most important and essential basic materials required for *Mūṣa* making and the following types of soils have been recommended in the texts for making them.

1. *Valmīka Mṛttikā* (Hillock soil)
2. *Kālinī Mṛttikā* (Black soil)
3. *Bhūnāga Mṛttikā* (Earth worm soil)
4. *Rakta Mṛttikā* (Red soil)
5. *Pita Mṛttikā* (Yellow soil)
6. *Śweta Mṛttikā* (White soil)

Of the above soils, which are greyish or blackish in colour, coarse but without send content, greasy, sticky and heavy may be considered the best for making *Mṛttikā*. If such soil is not available the *Hillock soil,* the pot-makers soil or the yellow soil could also be used.

Parts of Mūsā

Mainly *Mūsā* have two parts : 1. Lower or basal part and 2. Upper part.

The lower part is the main part and is known as *Mūṣā*. The drugs are kept in it for heating. The upper part is a lid dish or covering *(Pidhānaka)* which is not necessarily required for all *Mūṣās*. To keep the *Mūṣā* and its *Pidhānaka* (covering) close to each other a *Sandhilepana* (sealing of the joint) is necessary which may be called *Sandhi Sandhāna, Randhraṇa, Addhraṇa, Samśleṣaṇa* and *Bandhana* according to the texts.

Uses of Mūṣās

Mūṣās are used for the following purposes : 1. *Rasa Mūrchana,* 2. *Rasa Śodhana,* 3. *Rasa Māraṇa,* 4. *Rasa Bandhana,* 5. *Dwanda Melāpana* (for mixing two or more metals). 6. *Bijanirvāpaṇa,* 7. *Drāvaṇa,* (melting) or *Vajradrāvana,* 8. *Satwa Pātana,* 9. *Sāraṇa,* 10. *Patrālepa,* 11. *Ranjana,* 12. *Sūta siddhikara,* 13. *Śūtaguṇa Vṛddhikaraṇa,* 14. *Satwapātana* of *Mṛdu dravyas* like *Tuttha* etc. 15. *Pāka of poṭṭali* etc. *Kalpa's.* 16. Quick purification of *drugs,* 17. *Śwedana* (boiling) 18. Any kind of *Pācana,* 19. *Vajra satwa pātana,* 20. *Varṇot-karśakaraṇa* (for making the colour brighter) and 21. *Dravya Nirvāpaṇa.*

Description of Mūsā

According to the texts different types of descriptions regarding various aspects of *Mūṣās* are

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available i.e. *Mūsās* are described in detail (i.e. their constituent materials, shape, method of preparation heat-resisting power and uses etc.) Some *Mūsās* are described only for their shape and purpose for which these may be used. The constituent materials and their method of preparation are not described. In some cases only constituent materials and purposes are described, no mention has been made regarding their shape, size and heat resistant power.

Vajra Mūṣā

Three parts of clay (generally mud which is sandy, yellowish white in colour and composed of big particles is used), one part of *śaṇa,* one part of horse-dung, one part of ash or paddy husk and half part of *maṇḍūra* (iron rust)–all these are taken together and pounded well. The crucible prepared out of this is called *Vajra mūṣā.* It is very strong and is used for taking out *sattva* (essence) of extremely hard substances like diamond. It is mentioned in *'Rasārṇav', 'Rasaratnākara', R. Cūdāmani, R.P. Sudhākara'* and *R.R. Sanuccaya.* Its shape is described as *Gostanākāra* (like the shape of the cow's breast) i.e. round or oval.

Constituent Materials : *Dagdha Tuṣa, Dagdha Vastra, Valmika Mṛttikā, Aṅgāra, Purāṇa loha Kiṭṭa,* white stone, *Dagdha gāra, Dagdha Valmika Mṛttikā, Dagdha Gajamala, Dagdha Aśwamala, Kṛṣna Mṛttikā, Narakeśa, Bhūnāga satwa, Śaṇa, Glass bottle, Śukti* and *Iṣṭikā cūrṇa, Viḍa lavaṇa, Pāsāṇa behda patra.*

Bhāvanā drugs : Vajra vallirasa, Jala, Ajādugdha, Mahiṣī dugdha, Balārasa, Matukuna śoṇita.

Method of Preparation : All the constituent drugs are to be powdered and may be mixed with *Tuṣa, Vastra, Kūpīcūrṇa, Sukti cūrṇa Narakeśa, Śana, Viḍa lavaṇa* etc., and pound them well till all the things are mixed well. Now triturate the mixture with all the liquids of *Bhāvanā drugs* for 3 days or till the paste becomes soft, smooth and sticky. Now mould it in a round-oval shape just like *Gostana* and dry it in a shade. Heat it in a strong fire to make it heat resistant and strong. This is called *Vajra Mūṣā.*

Uses : It is used for *Rasa Śodhana, Rasa Mūrchana, Rasa Māraṇa, Rasa Bandhana, Dwanda Melāpana, Bīja Nirvāpaṇa, Vajra Drāvaṇa, Satwa Pātana* and to do nearly all *Karmas.*

Heat-resistants power : It could stand strong heating for 4 *Yāmas,* i.e. (12 hours).

Gāra Mūṣā

It is mentioned in *Rasendra Cūḍāmaṇi, Rasa Prakaśa Sudhākara, Rasa Ratna Samuccaya,* and *Rasa Ratnākara.* Similar to *Vajra Mūṣā*

Materials : Dagdha Gārā, Loha kiṭṭa, Añgāra, Śaṇa, Kṛṣṇa Mṛttikā, Bhūnāga satwa, Dagdha Tuṣa, and *Mahiṣīkṣīra.*

Method of preparation : All the drugs are to be powdered finely and triturated with *Māhiṣa Kṣīra* or *Jala* for 15 days to make the paste soft and smooth. Now mould it like *Vajra Mūṣā,* dry it and heat it to make the same, strong and heat resistant.

Uses : It is used for ordinary *Rasakarmas.*

Heat resistant Power : It can resist strong heat for 2 *Yāma* (6 hours).

(Black-soil (one part) and ash of paddy-husk (six parts) should be mixed with adequate quantities of *maṇḍūra* (iron rust). *śaṇa,* etc., and used for the preparation of the crucible. This is called *gāra mūṣā).*

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Vara Mūṣā

It is mentioned in *Rasārṇava, Rasendra Cūḍāmaṇi, Rasa Prakaśa Sudhākara* and *Rasa Ratna Samuccaya*

Materials : Dagdha Tuṣa & Vastra. Añgāra, Mṛttikā Kūpicūrṇa, Pāṣāṇa cūrṇa, Bhūnāga Mṛttikā.

Method of preparations : Powder all the drugs finely and triturate with water till the paste becomes soft and smooth. Now mould it like *Vajra-Muṣa,* dry it and heat it to make the same strong and heat resistant.

Uses : It is used for general *Rasakarmas.*

Heat resistance power : It can resist strong heat for one *Yama* (3 hours) only.

Vajra Drāvaṇ Mūṣā

It is mentioned in *Rasendra Cūḍāmaṇi, Rasa Prakaśa Sudhākara* and *Rasa Ratnākara.*

Materials : Gārā, Bhūnāgasatwa, Saṇa, Dagdha Tuṣa, Māhiṣa kṣīra.

Lepana drugs : Matkunśoṇita, Bāladhwanī mūla (Tandulīyaka) *rasa.*

Method of preparation : All the drugs are powdered and mixed together, triturate them with water for 15 days to make the paste soft and smooth. Now mould it like *Vajra mūṣā* and allow it to dry. In the end it should be painted with the liquids of *lepana drugs* and heated in a strong fire to make it strong and heat-resistant.

Heat resistant-power : It can resist strong heat for 2-4 *Yāma* when full of material, otherwise it can resist heat only for 2 *Yāma* (6 hours).

Varṇa Mūṣā

It is mentioned in *Rasendra Cūḍāmaṇi, Rasa Prakaśa Sudhākara* and *Rasa Ratna Samuccaya.*

Constituent materials : Powdered *Rakta Varga drugs,* Powdered *Rakta Mṛttikā* (red soil) without stones.

Bhāvanā drugs : Juice of the *Rakta varga drugs.*

Lepana drugs : Tuvarī and *Puṣpakāsisa.*

Method of Preparation : Mix the powdered drugs with *Bhāvanā drugs* and triturate well till the paste becomes soft and smooth. Now mould it like *Vajra muṣā* and paint it with *lepana* drugs and allow it to dry. In the end heat it strongly to make the same, heat resistant and strong.

Uses : For *Varṇotkarṣa* (i.e. for making the colour brighter).

Heat resistance power : Ordinary, not specifically mentioned.

Andha Mūṣā

It is mentioned in *Rasārṇava, Sūta pradipikā, R.P. Sudhākara* and *Rasakāma Dhenu. Gostanākāra* with a lid having a pointed top.

Materials : Not mentioned in any text.

Uses : For *Patralepa, Rañjana Sāraṇa* and *Dwanda malāpana Karma.*

Raupya Mūṣā

It is mentioned in *Rasendra Cūḍāmaṇi, Rasa Prakaśa Sudhākara* and *Rasa Ratna Samuccaya.* Like *Vajramūṣā.*

Materials : White soil without stones, powder of *Śwetavarga drugs.*

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Lepana drugs : Sphaṭikā

Method of preparation : Mix the finely powdered drugs and triturate them with the decoction of *śwetavarga drugs* till the paste becomes soft and smooth. Now mould it like *Vajra mūṣā* and paint it with *lepana* drugs and allow it to dry. Heat it strongly to make the same strong and heat resistant.

Uses : For *Varṇot karṣa* (i.e. to make the white colour as bright as silver).

Bhasma Mūṣā

It is mentioned in *Rasārṇava* and R.K. Dhenu.

Materials : One part of brick powder and two parts of *tila bhasma.*

Method of Preparation : Mix all the drugs and triturate these with water to make soft and smooth. Now mould it like an ordinary *Mūṣā* and allow it to dry. In the end heat it strongly to make it strong and heat resistant.

Uses : For the purification of silver.

Heat resistance power : Not mentioned, ordinary.

Yoga Mūṣā

It is mentioned in *Rasendra Cūḍāmaṇi, Rasa Prakaśa Sudhākara* and *Rasa Ratna Samuccaya* and *Rasa Taraṅgiṇī.* According to *Rasa Ratna Samuccaya. Viḍa Mūṣā* is called *Yoga Mūṣā* but as per *Rasa Prakaśa Sudhākara, Rasendra Cūḍāmaṇi* and *Rasa Taraṅgiṇī.* It is a separate *Mūṣā.*

Shape : Like an ordinary *Mūṣā.*

Materials : Dagdha Tuṣa, Dagdhāñgāra, Mṛttikā, Valmika mṛttikā and *viḍa.*

Method of preparation : Mix all the finely powdered drugs and triturate them with water to make the paste soft and smooth. Now mould it in *Mūṣā* form and paint it with *Viḍa.* Allow it to dry and heat it strongly to make the same strong and heat resistant.

Uses : For mercury processings.

Heat resistant power : Not mentioned (ordinary).

Prakāśa Mūṣā

It is mentioned in *Rasārṇava, Sūtapradipikā,* and *R.K. Dhenu.*

Shape : Its shape is like a *Sarāva* (lid) which has a whole in its middle. Here *Mūṣā* and *Pidhānaka* are joined together by *Sandhibandhana.* As there is a hole in its middle portion which allows *Prakāśa* (light) to enter into the *Mūṣā* hence the name *Prakāśa Mūṣā* is given to it.

Method of preparation : Here *Mūṣā* and *Pidhānāka* are prepared separately and then joined together to make them in the *Mūṣā* form.

Uses : For *Bija Nirvāpaṇa* or *Dravya Nirvāpana* and *Sāraṇa.*

Pakwa Mūṣā

It is mentioned in *Rasendra Cūḍāmaṇi, Sūta Pradipikā, Rasa Prakaśa Sudhākara, Rasa Ratna Samuccaya* and *Rasa Kāma Dhenu.*

Shape : Like *Bhāṇḍa* (pot) of the Potmaker

Method of preparation : Make the *Mūṣā* with ordinary constituent materials, and heat it strongly to make the same strong and heat resistant.

Uses : For *Poṭṭalyādi Pācana,* and *Swedana,* for quick purification and for doing all type of *Pākakarmas.*

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Gola Mūṣā

It is mentioned in *Rasendra Cūḍāmaṇi, Rasa Ratna Samuccaya* and *Rasa Kāma Dhenu..*

Shape : Round like a ball.

Method of preparation : Make two round shaped cups, put the roasting materials inside, now join them together to make a *Mūṣā.* As it is round from all sides, it is named as *Gola Mūṣā.*

Uses : For quick purification, Rodhana (potentiation of mercury) and *Drāvaṇa* (melting).

Heat resistance power : Ordinary.

Mahā Mūṣā

It is mentioned in *Rasendra Cūḍāmaṇi, Rasa Ratna Samuccaya, Rasa Prakaśa Sudhākara* and *Rasa Taraṅgiṇī.*

Shape : The lower portion of this *Mūṣā* is like an Elbo joint i.e., small and pointed at the base with gradually broadening upper portion. Thus its shape is just like a big and round shaped brinjal. According to *Rasa Tarañgiṇī* its bottom is round and flat having a big and broad mouth. As the *Mūṣā* is quite long and broad, it is called *Mahā Mūṣā.*

Constituent materials : Same as used, those generally

Method of preparation : Its bottom should be small and pointed and upper portion should gradually be made broad with quite a big and broad mouth.

Uses : For *Loha puṭapāka* for *Satwapātana* of *Abhraka* and *Mūṣika* and also for their *Drāvaṇa.* As per *R.P.S.* It is used for quick purification.

Maṇḍūka (Manjūṣa) Mūṣā

It is mentioned in *Rasendra Cūḍāmaṇi, Rasa Prakaśa Sudhākara, Rasa Ratna Samuccaya* and *Rasa Kāma Dhenu.*

Shape : Just like *Mānjūṣā* (*Peṭikā* or box) or like a *Manḍūka* (frog) i.e. it is square in shape having the depth, length, breadth & height of about 6 *angulas* each.

Constituent materials : Same as used generally.

Method of preparation : It must be prepared of the shape as mentioned above.

Uses : Used for *Puṭapāka* and *Rasa Māraṇa.* Usually kept inside the earth for the above purposes.

Musal Mūṣā

It is mentioned in *Rasendra Cūḍāmaṇi, Rasa Prakaśa Sudhākara* and *Rasa Ratna Samuccaya.*

Shape : As the name indicates it is just like a *Musala* (Cylinder) which has a flat bottom and round on all sides. Its length is about 8 *angulas.*

Constituent materials : Same as used for other *Mūṣās.*

Method of preparation : *Mūṣā* materials are moulded in a *Musala* shape i.e. Flat base and round body like a cylinder. It is a long *Mūṣā* like a *Musala.*

Uses : Used for preparing *Cakrabaddha Rasa.*

Dīrgha Mūṣā

It is mentioned in *Rasa Kāma Dhenu*

Shape : As the name indicates *hasta* it is a long *Mūṣā* which has a length of one and a half.

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Materials : It is generally made of iron.

Method of preparation : Make an ordinary *Mūṣā* cover its top with a dish (*Śarāva)* seal the joints properly. Now attach a long tube similar to *Dhattūra puṣpa* to the *Saṁpuṭa* through a hole in its middle. The length of this tube may be one and half *hasta*. As it is very long hence called *Dīrgha Mūṣā.*

Uses : It is used for *Sūraṇa karma* and *Satwapātana.*

Garbha Mūṣā

It is mentioned in *Rasa Kāma Dhenu*

Materials : It may be made like a *Sāmānya Mūṣā* with the usual materials. As it is kept inside the earth and covered with sand it is called *Garbha Mūṣā.*

Uses : Used for *Pāradabañdhana.*

Suṣka Mūṣā

It is mentioned in *Rasa Kāma Dhenu*

Materials : Dagdha tuṣa, Lohakiṭṭa, Gairika, Kulāla, Mṛttika, Śweta Mṛttika, and *Chalk.*

Method of preparation : Mix all the drugs well, ground them to a soft and smooth paste. Mould it in an ordinary *Mūṣā* form.

Uses : For ordinary *Rasakarmas.*

Prakata Mūṣā

It is mentioned in *R. Ratnākara*

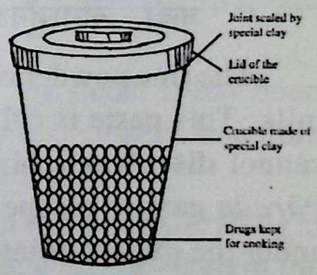
Shape : Like a *Śrāvaka.*

Materials : Same as those for an ordinary *Mūṣā.*

Method of preparation : When the *Vajra Mūṣā* is made deep like a *Srāvaka* with a hole in its middle the same is called *Prakaṭa Mūṣā.*

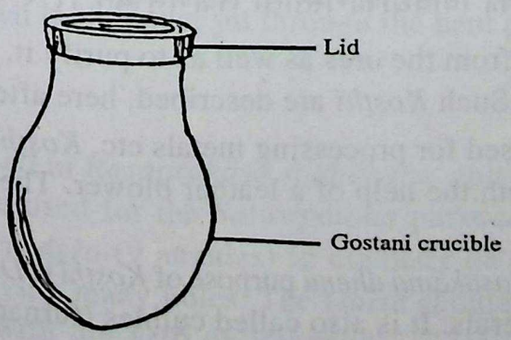
Uses : Used for *Sāraṇa* and *Bija Nirvāpaṇa.*

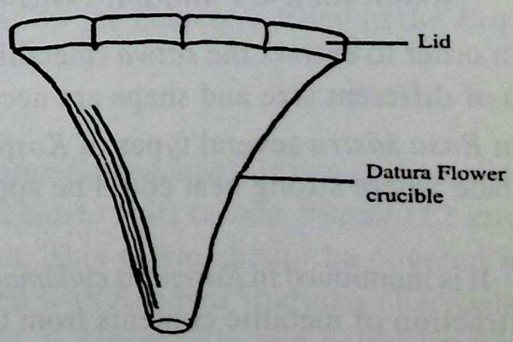
Sāmānya Mūṣā (Crucible for general use)



Charcoal, ash of the paddy husk, fibres of *śaṇa (Crotalaria juncea* Linn.) and horse-dung are taken together and mixed well by pounding with a hammer. A cone or funnel shaped crucible prepared of this material is called *sāmānya mūṣā* (crucible for general use) if any specefic type of crucible is not prescribed, then this general type of crucible is used in the pharmaceutical process. If it is used for mixing two metals by melting together, then it is called *dvandva melāpana mūṣā.*

Gostanī Mūṣā





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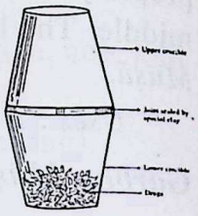
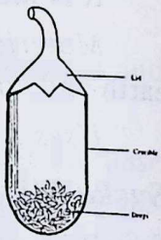
The crucible prepared according to the size and in the shape of the nipple of cow is called *gostanī mūṣā*. It is generally used for taking out *sattva* (essence) of mica, etc. It is used with a lid. If it is shaped like the flower of *dhattūra (Datura metel* Linn.), it is called *dattūra puṣpa mūṣā*



Malla Mūṣā

If two round crucibles are kept face to face and used for the preparation or recipes, it is called *malla mūṣā*.

Vṛntāka Mūṣā



A crucible of 6" length and 2" breadth and having the shape of a brinjal should be prepared. It should have a hole at the top and through this, a lid of the shape of *dhattūra* flower having wide mouth and 4" tube should be inserted. This is called *vṛntāka mūṣā*.

Toya Mṛṭṭika

लेहवत्कृतब्बूलक्वाथेन परिमर्दितम् । जीर्णकिट्टरजः सूक्ष्मं गुडचूर्णसमन्वितम् ।
इयं हि जलमृत्प्रोक्ता दुर्भेद्या सलिलैः खलु ।। र.र.स. ९/६२

The finely powdered *Maṇḍūra* (oxide of iron) is mixed with equal quantity of *guḍa* (Jaggery) and *Cūrṇa* (lime). This mixture is vigorously ground in the semisolid *kwātha* (decoction) of *Babbula* (The decoction is boiled until the semisolid sticky material is available-*Rasakriya*). This paste like substance is known as *Toyamṛṭṭika* or *Jalamṛṭṭika* which is used for sealing the joints. This makes the joints water proof.

Vahni Mṛṭṭika

खटिकापटुश्चकिट्टैश्च महिषीदुग्धमर्दितैः । वन्हिमृत्स्ना भवेद्घोरवन्हितापसहा खलु ।।
एतया मृत्स्नया रूद्धो न गन्तुं क्षमते रसः । विदग्धवनिताप्रौढप्रेम्णा रुद्धः पुमानिव ।।
नन्दी नागार्जुनश्चैव ब्रह्माज्योतिर्मुनीश्वरः । वेत्ति श्रीसोमदेवश्चै नापरः पृथिवीतले ।।र.र.स. ९/६३-६५

The fine powder of *Khaṭika* (chalk), salt, and *Maṇḍūra* in equal quantities are ground in buffallo's milk. This paste is called *Vahnimṛṭṭika* which can sustain very intensive heat of the fire. As a man cannot disentangle himself from the grip of matured love of a sensuous woman, in the same way *Pārada* cannot escape from the crucible, which is sealed with the help of such *Vahnimṛṭṭika*, even under the impact of intensive fire. No body has the knowledge of the power this *Vahnimṛṭṭika* , except the *Rasaśātra* scholars like *Nandi*, *Nāgarjuna*, *Brahmajyothi*, *Munīśwara* and *Śrī Śomādeva*.

Koṣṭhī (Specially Prepared Fire-Place)

सत्वानां पातनार्थाय पातितानां विशुद्धये । कोष्टिका विविधाकारास्तासां लक्षणमुच्यते ।। र.र.सा. ९/३२

In order to extract the *satwa* (metallic part) from the ores as well as to purify it, Koṣṭis (furnace-stove) of different size and shape are necessary. Such *Koṣṭhī* are described, here after.

In *Rasa śāstra* several types of *Koṣṭhī* are used for processing metals etc. *Koṣṭhī* is a specialised fire-place where strong heat could be applied with the help of a leather blower. These are of several types.

It is mentioned in *Rasendra cuḍāmaṇi* and *Rasakāma dhenu* purpose of *Koṣṭhī* is *Dhātusatwapātana* i.e. extraction of metallic contents from the minerals. It is also called culhies (furnaces).

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According to *'Rasendra cuḍāmaṇi'* a *koṣṭhī* should have the *vistāra* (breadth) of 16 *angulas* where as according to *Rasa Kāmadhenu* its *vistāra* (breadth) should be of 12 *angulas*. Its *Āyama* (length) should be one *hasta* (18" or 24 *angulas*) and should have an equal size from all sides. Its shape must be (squire) and should have one opening.

This is general description regarding the *koṣṭhī yantra*. Now various types (*Prakaras*) of the *koṣṭhis* will be discussed. According to the texts *koṣṭhis* have the following four types :

Angāra Koṣṭhī

It is mentioned in *'Rasa Prakāśa Śudhākara'* and *Rasaratna Samuccaya*. According to them it is a big *koṣṭhī* which may be utilized for the *satwapātana* of *khara* or *kaṭhina dravyas* i.e. for the extraction of metals from the hard (high melting points) substances. Its height should be one *Rājahasta* (30 *angulas*), breadth 12 *angulas*, shape-squire, should be plastered with mud or clay on all sides, should have hole of the length and breadth of one *vitasti* (12 *angulas*) on one side-wall and opening of one and a half *vitasti* an (18 *angulas*). A stand may be prepared just below this opening for blowing air into it. There will be a wall about one *pradeśa mātra* (9 *angulas*) in length just above the opening. Make another opening about 9 *angulas* in length and breadth just above this wall. This opening should be closed with a brick and sealed during operation, just before the operation fill it with charcoal and blow it with a blower. The upper opening should be used for filling the charcoal and putting the *dhamana Dravya* in the *koṣṭhī*. This is know as *Angārakoṣṭhi*. The description of *Angārakoṣṭhi* given in *'Rasaratna Samuccaya* closely resembles the above description i.e. of *'Rasa-Prakāśa sudhākara.* But the has described it in his own language.

Pātāla Koṣṭhi

Dig a *Garta* (pit) of 12 *angula* deep in the earth. Another round *Garta* is to be dug inside the first *Garta*. Put a strog *kharpar* a (dish) over the inner *Garta* and fill the whole of the first *Garta* with charcoal and below it with a blow pipe. This is known as *Pātāla koṣṭhī*. This is good for the extraction of *satwa* from the drugs which have a low melting point. This is a smaller furnace than the first one and as such may not give a high temperature.

This has also been described in *Rasaratna samuccaya*. The purpose is the same. It has been described by *Acārya Nandi*. The description of *Pātāla koṣṭhī* according to this text closely resemble the above description with one modification in its construction which is as follows :

According to this description a bent pipe made up of iron is to be fitted in the inner *Garta* right from the lower portion of the *Garta* to the earth surface, in such a way that one end should open in the lower portion of the inner *Garta* and another end should open slightly up from the earth surface to blow the air. The inner *Garta* should be covered with a round ring-shaped lid having holes. The advantage of this modification is that the *Dhamana dravya* could be placed over this covering and the air could be blown in the inner pit through the bent pipe to allow the charcoals filled in the *Koṣṭhī* to burn properly.

Gāra Koṣṭhī

It is described in *Rasaprakāsa sudhākara'* and *'Rasaratna Samuccaya'*. It is a still smaller furnace and may be used for the *Satwapātana* purpose. Dig a *Garta* (pit) of one *Vitasti* (12 angulas) depth and one *Pradeśa* (9 angulas) in diameter on the earth. This *Garta* should be covered with a *pidhāna* (lid) having many holes. The *Garta* should be filled with *Aṅgāras* (burning charcoals) and may be blown with the help of *Vaṅkanāla*. This is known as *Gārakoṣṭhī* and could be used for

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satwapātana. The description of *Rasa Ratna Samuccaya* also resembles with the above description. The only difference seen is that pit of 12 *angulas* depth one *valaya* (circular ring like structure) should be made at the height of 4 *angulas* from the bottom and a *'Cakrī'* Circular-plate having many holes may be placed over the *valaya* and it should be filled with charcoals and blown worth *Vankanāla.* The other speciality is in its purpose i.e. it is said to be *Sṛsṭa lohavināśinī* which means it may be used to separate *mixed lohas.*

Tiryak-Pradhamana Koṣṭhī

It is mentioned in *'Rasaprakāsa Sudhākara* and *'Rasaratana Samuccaya'*. Its purpose is mentioned as *Satwapātana* from the *Mṛdu dravyas* and *Śodhana* of *Mṛdu dravyas.* This *Koṣṭhī* should have a height of one *Vitasti* (12 *angulas*), its bottom should be of 4 *angulas* in diameter. This is known as *Tiryak-pradhamana Koṣṭhī.* As per the description of *Rasa Prakaśa Sudhākara,* it may be used for the extraction of *Satwa* from *Mṛdu dravyas,* whereas in *Rasa Ratna Samuccaya* its purpose is said to be *'Mṛdu dravya Viśodhana'*.

PUṬA

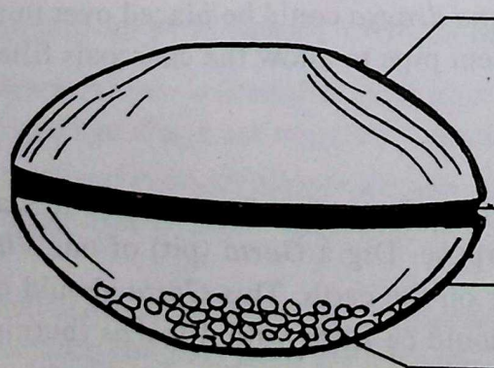
Different types of metals, minerals, gems and jewels need application of different amount of heat to be reduced to *bhasma* form. They are cooked in a specially designed fire-place which is called *puṭa.* Depending upon the heat requirement, some of them are arranged in pits of different sizes dugs in the earth and some others are done over the ground. Cow-dung cake is generally used as fuel. Metal, etc., are kept inside two earthen plates *(śarāva sampuṭa)* put face to face and the joint sealed with the help of seven layers of mud-smeared cloth. Before cooking, this sealed container is well dried. The main purpose of the *puṭa* is to cook the material with the required quantity of heat constantly for a sufficient period. Once ignited, all the cow-dung cakes should be allowed to burn. When the fire is over, and the fire place is cooled down, the container should be removed. The layers of mud smeared cloth which were used for sealing the joint should then be scrapped and two plates separated to remove the metal, etc., inside for further processing. Some important types of *puṭa* are described hereafter.

Puṭa yantra

शरावसम्पुटान्तःस्थं करीषेष्वग्निमानवित् । पचेच्चुल्ल्यां द्वियामं वा रसं तत्पुटयन्त्रकम् ।। र.र.स. ९/४५

A *Saṁpuṭa* is prepared by taking two *Śarāvas* (earthen pots), in which *Pārada* is already kept. Then this *Saṁpuṭa* is kept in the midst of cowdung cakes, the numbers of which are decided by the scholars, or it is kept on the stove and heated for 2 *Prāhara* (6 hrs). This *Yantra* is called *Pūṭa Yantra.*

Śarāva Saṁpuṭa (Enclosure With Two Earthen Plates)



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If any metal or mineral is to be reduced to *bhasma* form, then first of all it is triturated with other prescribed drugs and made to a paste. From out of this paste, small round and flat cakes (*cakrikās*) of about one inch in diameter are prepared. These cakes are then dried in the sun. Thereafter, these cakes are kept inside two earthen plates and the joint of these plates is sealed by wrapping seven layers of mud- smeared cloth. Then this is dried in the sun before cooking in a *puṭa*. This is called *Śarāva Saṃpuṭa*.

रसादिद्रव्यपाकानां प्रमाणज्ञापनं पुटम्। नेष्टो न्यूनाधिकः पाकः सुपक्वं हितमौषधम्।।

(र.र.स. १०/४७)

Puṭa is the process in which the degree of the heat, which is necessary for the incineration of *Rasa, Maharasa, Uparasa* or metals, is understood. It is seen that the degree of heat is neither less nor more than necessary, in this process.

लोहादेरपुनर्भावो गुणाधिक्यं ततोऽग्रता। अनप्सु मज्जनं रेखापूर्णता पुटतो भवेत्।।
पुटाद्ग्राव्णो लघुत्वञ्च शीघ्रव्याप्तिश्च दीपनम्। जारितादपि सूतेन्द्राल्लोहानामधिको गुणः।।
यथाश्मनि विशेद्वान्हिर्बहिस्थपुटयोगतः। चुर्णत्वाद्धि गुणावाप्तिस्तथा लोहेषु निश्चितम्। (र.र.स. १०/४८-५०)

Puṭa helps in converting the metals/minerals into *Bhasma* and such *Bhasmas* become *Apunarbhava* (means *Bhasmas* cannot be rconverted into metals). In the state of *Bhasma,* metals/minerals gain more benificial qualities and become excellant. These *Bhasmas* become *vāritara* (very light so that they can float on surface of the water) and *Rekhapūrṇa* (very minute so that they can enter into the *grūves* of fingers). Due to such a process of *Puṭa,* minerals become very light (for digestion too) and can readily assimilate and the digestive power is enhanced by intake of the *Bhasmas,* which is due to nothing but the process of *puṭa.* The *Bhasmas* of the metals like iron etc. attain more superior qualities than the *Pārada,* which has undergone the process of *Jāraṇa.* These minerals, by the impact of the process of *Puṭa,* turn into *Bhasma* and obtain excellent qualities like the other mineral drugs which are contained in to *saṁpuṭa* and become *Rekhapūrṇa* powder (*Bhasma),* by the heat of the external fire and attain beneficial qualities.

Anukta Puṭa (Untold Puṭa)

अनुक्तपुटमाने तु साध्यद्रव्यबलाबलात्। पुटं विज्ञाय दातव्यमूहापोहविचक्षणैः।।

(र.र.स. १०/६४)

If there is no indication in the text, of a specific *puṭa,* the scholars should assess, on the basis of the hardness or softness of the mineral in question and decide accordingly, the type of *puṭa* to be used.

Sandhilepa

मूषापिधानयोर्बन्धे बन्धनं सन्धिलेपनम्। अन्ध्रणं रन्ध्रणं चैव संश्लिष्टं सन्धिबन्धनम्।।

(र.र.स. १०/५)

The scaling of the joining parts of each *Mūṣā* and the lid is also called *Bandhana, Sandhilepa, Andhraṇa, Saṁśliṣṭa.*

Vanopala

पिष्टकं छगणं छाणमुपलं चोपलं तथा। गिरिण्डोपलसाठी च वराटी छागणाभिधाः।।

(र.र.स. १०/६५)

Vanopala (cowdung cakes) are also call *Piṣṭaka, Chhagaṇa, Chhāṇa, Utpala, Giriṇḍa, Upalasāṭhi and Varāṭī.*

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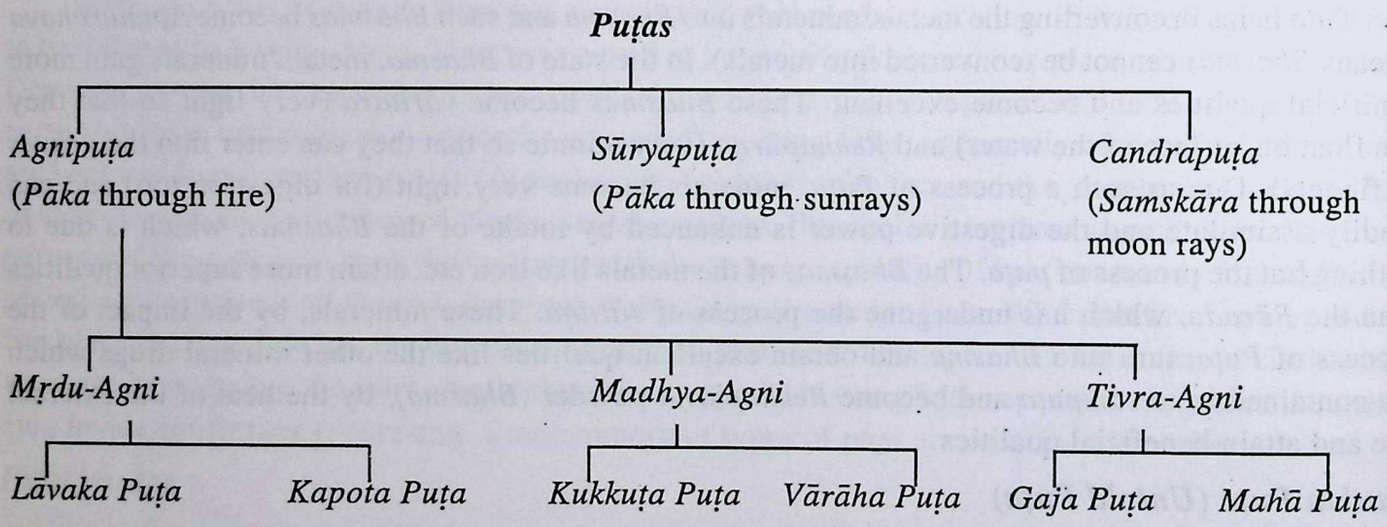
In *Ayurvedic Rasa* literature various types of *Puṭas* have been mentioned. These are considered necessary for preparing different *Bhasmas* from different metals and minerals.

In the general sense *Puṭa* means the mode of heating the *Rasādi Drugs* (metals & minerals) while in specific sense *Puṭa* indicates the source and amount of heat required or considered the necessary for the *Pāka* (conversion) of the substance into a suitable dosage form so as to make it absorbable into the system. Thus the term *Puṭapāka* used in this context forms a part of *Māraṇa* process which helps in converting the metals and minerals into a *bhasma* form by disintegrating their particles to a fine state of sub-division through the application of heat from different sources.

From the point of view of source of heat *Puṭa,* may be of two types mainly viz-1. *Agnipuṭa* and 2. *Sūryapuṭa.* The third type *'Candrapuṭa'* is also mentioned by late Sri. *Jādavaji Ācārya.* However, it is not mentioned in other *Rasa Texts* since it is not likely to take part in the *Pāka karma.* Of these *Agnipuṭa* is common and may again be divided into 3 types depending upon the degree of heat applied through i.e. *Mṛdu, Madya* and *Tivra.* Each division is further sub-divided into various types on the basis of the quantity of the fuel and the size of the furnace. The *Puṭas* have also be divided on the basis of the type of fuel, apparatus and the medium of heat used.



Number of Puṭas : It is evident from the literature that for completing *Māraṇa* process *Puṭas* are required to be repeated for a number of times depending upon the nature of the drugs being subjected for and the therapeutic values to be attained. From the therapeutic point of view 10 to 100 *Puṭas* have been considered sufficient, while for making the *Bhasmas* effective as *Rasāyana* 100 to 1000 *Puṭas* are considered necessary. As regards the nature of the drugs, the calcium compounds need a smaller number of *Puṭas* while metals like iron, copper, lead etc. need a higher number of *Puṭas* for their complete *Māraṇa Process.*

Method Puṭapāka

The drugs subjected for *Puṭapāka* should be put in the *Muṣā* (crucible) or *Sarāva Sampuṭa* and sealed properly. This may be placed in the middle of the furnace in such a way that heat may penetrate into the drug particles and may convert them into a suitable compound.

Aims and importance of the Puṭas

The following aims and the importance of *Puṭas* have been mentioned in the texts. According to that *Lohādi* metals when subjected to *'Puṭapāka'* not only lose their shape, form & characteristics and

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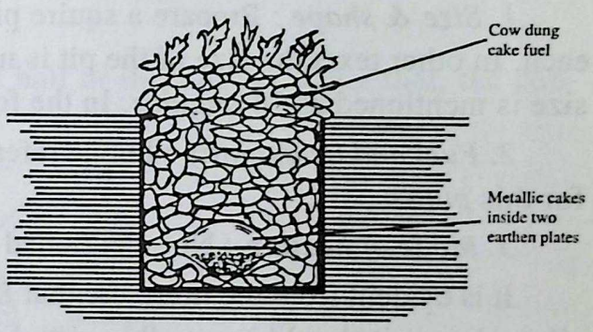
the products thus prepared can not be reconverted into their original form. It helps in acquiring better therapeutic properties, and in reducing them to such a fine state of sub-division that the final product when powdered and put over water surface may float on is surface, enter into the furrows of the fingers. It is said further that by this process the drugs are converted into a light state so that when they are used internally they are digested and absorbed quickly due to their lightness and fineness. They also helps in stimulating normal metabolic functioning of the systems. According to other texts the application of *Puṭas* not only helps in making the metals & minerals to acquire better therapeutic values but also in removing or reducing their toxic properties to such an extent that they may not produce any harmful effects on the body tissue when used for therapeutic purposes.

Types of Puṭas : According to the texts *Puṭas* have been divided into various types on the basis of the size of the furnace, quantity and nature of the fuel used and the apparatus in which it is given. These *Puṭas* are named mostly after the names of animals which are to indicate their size and the temperature range.

Mahā Puṭa



As the name indicates this is the biggest *Puṭa* described in the texts.

1. Size and Shape : Prepare a squire pit (in the earth) which may have a depth & breadth of 2 *hastas* (about 36") each.

2. Fuel : 1000 *Vanyopalas* are recommended for filling the pit before putting the *Muṣā* or *Sampuṭa* while 500 *Vanyopalas* are to be filled after keeping the *Muṣā* or *Sampuṭa* in it.

3. Mode of heating : Put the *Muṣā* or *Sampuṭa* after filling the two-thirds of the pit with fuel, cover it with remaining fuel and apply fire. After burning the fuel allow it to cool by itself and collect the material next day. This is known as *Mahāpuṭa.* In this *Puṭa* intense fire is maintained for a long time as the quantity of the fuel used here is more which needs longer time to burn. Thus the material subjected to hang through this *puṭa* remains in contact with the fire for a long tie.

Gajapuṭa

This is also a big *puṭa* but it is smaller than *Mahāpuṭa.* It can kill (reduce to ash) all the metals & minerals without any difficulty like an elephant.

1. Size & shape : Prepare a squire pit having a depth & breadth of one *Rājahasta* (about $22^1/_2$") each.

2. Fuel : Though any specific mention about the nature of the fuel is not seen in the texts *vanyopalas* as fuel may be used in a quantity sufficient to fill the pit of the above size. 2/3rd of the fuel may be filled first in the pit while 1/3rd of the fuel is filled after putting the *Muṣā* or *Sampuṭa* in the furnace.

3. Mode of heating : After filling 2/3rd part of the pit with fuel the *Mūsa* or *Saṁpuṭa* is kept and remaining 1/3rd part is filled with fuel later on to cover the *Muṣā* or *Sampuṭa* and then apply fire. After burning the fuel completely furnace is allowed to cool by itself and next day the *Muṣā* or the *Sāmpuṭa* is taken out for collecting the meterial.

Here also intensefire is maintained for a long time but as its size is small and the quantity of the fuel is also less, the time needed for burning the hole fuel will also be less. But the range of the temperature may be same in both the *puṭas*, the difference will be only in maintainence time.

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Vārāha Puṭa

Vārāha is big and because *puṭa* is similar to *Varāha* in size, it is known as *Varāha,* it is smaller than *Gajapuṭa* as *Varāha* (pig) is also a small animal than *Gaja* (elephant).

Size & shape : An *Aratni* size *kuṇḍa* (squire pit) is prepare for this *puṭa, Aratni* is equal to 18" in size. No other description is available for this *puṭa* in the literature.

Fuel : Vanyopalas as mentioned in previous *puṭas.*

Mode of heating : Same as in previous *puṭas.*

Kukkuṭapuṭa

Kukkuṭa is cock and the *Puṭa* similar to it in size is known as *Kukkuṭa puṭa.* It is a still smaller *puṭa.* In the literature several descriptions are available regarding this *puṭa.* In the 'Rasa Ratna Samuccaya' it is described as follows :

1. Size & shape : Prepare a squire pit having a depth & breadth of 2 *Vitasti* (about 24 *aṇgulas*) each. In other texts the size of the pit is mentioned as one *vitasti* instead of two. In third reference its size is mentioned as 16 *aṇgulas.* In the fourth reference its size is mentioned as 6 *aṇgulas* only.

2. Fuel and its quantity : In one reference 10 *vanyopalas* have been mentioned to be used as fuel for this *puṭa.*

3. Mode of heating : Not mentioned specifically, same as for previous *puṭas.*

It is evident from the literature that *Kukkuṭa puṭa* may be used to heat *Mṛdu Dravyas* like Gold & silver, hence it should be small in size.

Kapota puṭa

Kapota is parrot and the *puṭa* similar to the size of *kapota* is known as *kapota puṭa.* For this no pit is needed. It is given on the earth using 8 *vanyopalas* as fuel. Its purpose is to make the *bhasma* of *baddha pārada* (solidified *pārada*) as it is recommended for *Preparing Rasa bhasma* which could not stand strong heating 8 *vanyopalas* are considered sufficient.

Lāvaka puṭa

Lāvaka is a small bird and the *puṭa* similar to the size of *lāvaka* is known as a *lāvakapuṭa.* Here instead of using *Vnyopalas* as fuel straw or husk (*Tuṣa* or *Govara cūrṇa*) is used as fuel in one *pala* quantity. It gives a very low temperature and may be used for the highly soft type (with very low melting point) of mineral drugs.

Govara puṭa

As the name indicates, *Govara cūrṇa* (cow dung powder) is used in this *puṭa* as fuel instead of *vanyopalas.* Thus a very low heat is given in this *puṭa.* It is also a small *puṭa* and recommonded for preparing *Resabhasma.*

Bhāṇḍa puṭa

Here also *tuṣa* (husk) is used as fuel but the quantity of husk used in this *puṭa* is greater, as a big size *bhāṇḍa* (pot) has to be filled with husk for this *puṭa.* Here *puṭa* is given in a *Bhāṇḍa* instead of a pit or furnace hence the name *Bhāṇḍa puṭa* is given to it.

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Vālukā puṭa

Here instead of using *Tuṣa* or *Govara cūrṇa* as fuel *vālukā* (sand) is used as the medium of heat. This gives a uniform heating to the material. Here also slow heat is given through sand bath.

Bhūdhara puṭa

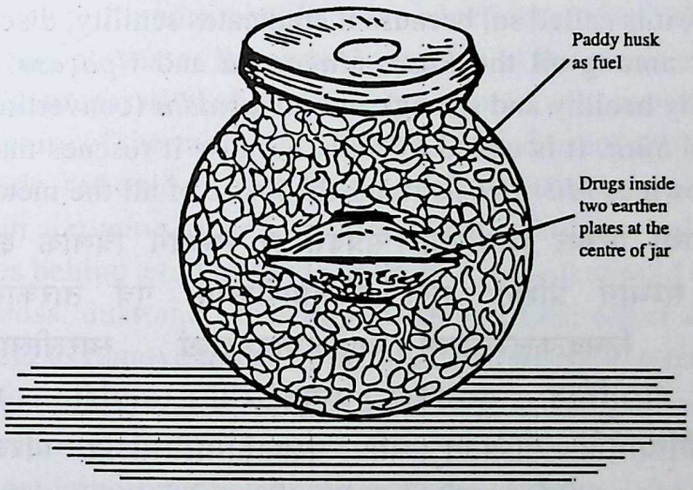
Dig a small pit of 2 *añgula* depth on the earth and put the *muṣā* in it and apply heat from the above through *vanyopalas*. This is known as *Bhūdhara puṭa.*

When no puṭa is mentioned

In the absence of any recommondation about the type of *puṭa* to be applied it should be decided considering the nature of the substances subjected to *'puṭa pāka'*. If it is a *Mṛdu* type drug than the *puṭa* having above heating capacity may be chosen but if *Madhya* or kathina type drug then the *puṭa* having a moderate or high degree of heating capacity may be used.

Bhāṇḍa Puṭa

An earthen pot should be filled up with paddy-husk till half of its capacity. Over that, the con-



tainer of the recipe should be kept and then the remaining portion of the pot should be filled up with paddy-husk. This should then be ignited. This is called *bhāṇḍa puṭa.*

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Chapter 5

RASA (PĀRADA)

It is well known as *pārada* because it helps a person to achieve salvation. Mercury is a silver white liquid metal with a slight bluish finish. In thin films, it transmits violet light. According to ancient literature connected with *'Rasaśāstra,' Rasa* (mercury) has been described as of divine origin and said to be related to *Lord Śiva* or *Hara*. In *'Rasaratnasamuccaya'* a detailed mythological description with regard to its origin is available. According to this it is the product of *Siva-Śaktisamāgama.*

Definitions of Rasa

रसनात् सर्वधातूनां रस इत्यभिधीयते । जरारुङ् मृत्युनाशाय रस्यते वा रसो मतः ।।
रसोपरसराजत्वाद्रसेन्द्र इति कीर्तितः । देहलोहमयी सिद्धिं सूते सूतस्ततः स्मृतः ।।
रोगपंकाब्धिमग्नानां पारदानच्च पारदः । सर्वधातुगतं तेजोमिश्रितं यत्र तिष्ठति ।।
तस्मात् स मिश्रकः प्रोक्तो नानारूपफलप्रदः ।। र.र.स. १/७७-७९

It is called *Rasa* because it has the power to digest and assimilate other metals like *swarṇa* and minerals like *abhraka*. Also, it is called so, because it eradicates senility, diseases and death, is called *Rasendra*, as it is superior among all the *Rasa, Maharasa* and *Uparasa*. As it brings about the *Dehasiddhi* (making the body healthy and strong) and *Lohasiddhi* (converting the lower metals in to gold and silver), it is named *Sūta*. It is called *Pārada*, because it rescues man who is trapped in the swamp of diseases. It is known as *Miśraka*, as it has the lustre of all the metals, concentrated in it.

शैलेऽस्मिन्शिवयोः प्रीत्या परस्पर जिगीषया । संप्रवृत्ते च सम्भोगे त्रिलोक क्षोभकारिणि ।।
विनिवारयितुं वन्हिः सम्भोगं प्रेशितः सुरैः । कांक्षमाणैस्तयोः पुत्रं तारकासुरनामाकम् ।।
कपोतरूपिणं प्राप्तं हिमवत्कन्दरेऽनलम् । अपक्षिभावसंक्षुब्धं स्मरलीलाविलोकिनम् ।।
तं दृष्ट्वा लज्जितः शम्भुर्विरतः सुरतात्तदा । प्रच्युतश्चरमो धातुर्गृहीतः शूलपाणिना ।।
प्रक्षिप्तो वदने वन्हेर्गगायामपि सोऽपतत् । बहिः क्षिप्तस्तया सोऽपि परिदन्दह्यमानय ।।
संजातास्तन्मलाधानाध्धातवः सिद्धि हेतवः । यावदग्निमुखाद्रेतो न्यपतत्भूदूरिसारतः ।।
शतयोजननिम्नांस्तान् कृत्वा कूपांस्तु पंच च । तदा प्रभृति कूपस्थं तद्रेतः पंचयाऽभवत् ।।

In the mountain of *Himālaya*, *Lord Śiva* and *Godess Pārvathi* with mutual affection and with the desire of defeating each other, started the sexual copulation, which was capable of creating the commotion (disturbance), throughout the three worlds. Intending to procure a son capable of killing the demon *Tārakasura*, resulting out of this seemingly endless act of copulation, the *Gods* sent, *Agni* to terminate the sexual act. Disguisig like a pigeon, the *Agni* sitting in the *Himālayan* cave, when witnessed the sexual act of *Śiva* and *Pārvathi*, felt shy, contrary to the feelings of a bird (as he was in the form of bird). When *Śiva* saw that, this was not a bird but *Agni* he too felt shy and stopped the act of coitus. At the same time (moment), he took the ejaculated semen in to both the hands and hurled it upon the *Agni*. Unable to bear the intensity of the semen, *Agni* in turn, threw it away in the river *Ganga*. But even *Ganga* could not bear its ferocity and she too expelled it out. Out of the blemeshes of this semen, emerged different kinds of metals, which are capable of making the body stable. On the banks of *Ganga*, wherever the semen dropped from the face of *Agni*, there formed five wells, each one hundred *yojana* deep. From then onwards five kinds of *Pārada* was formed in those wells. Which in scientific terminology may be explained as follows. There was a *''Trilokīkṣobhakāri Sānkṣobha''*

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when *Śivaśakti samagama* took place. It means that when temperature rises inside the earth volcanic explosions, causing earthquakes, occur. This in due course causes various liquids to come out with fumes. These liquids contain mercury along with other molten metals. Owing to its heaviness mercury moved down deep into the earth and got collected. And thus occasionally it is obtained in the native form too from the mines in small amounts as globules. Generally it is obtained in the form of ores. In modern scientific terminology mercury is called *Hydrargyrum* and quick silver which means it is like liquid silver which moves quickly. In Astrology mercury is one of the stars and is white and movable. Thus the name mercury is given to this metal which is also white and movable.

It does not undergo oxidation in air at ordinary temperature, but tarnishes in air containing traces of hydrogen sulphide. It is not acted upon by dilute or concentrated HCl. But it dissolves in hot concentrated sulphuric acid with evolution of sulphur dioxide and formation of mercuric sulphate. It also dissolves in fairly dil. cold nitric acid to form mercurous nitrate but with hot concentrated nitric acid a mercuric nitrate is produced. Mercury always forms liquid or solid *amalgams* with many other metals. The chief source of mercury is mercury sulphide (Hgs) (Cinnabar). But mercury is also found as small liquid silvery globules in the veins of cinnabar. This is known as native mercury. In the veins of cinnabar native mercury is found probably as a reduction product of Hgs by the action organic acids. The native metal also possesses the same properties as the commercial metal. Mercury and its compounds are used in the preparation of pharmaceutical products, as catalyst in chemical warfare, in medicine, in the manufacture of thermometers, explosives and in several other chemical industries. It is used in the form of oxide, red oxide, chloride and sulphide. Mercury, which usually contains metallic impurities, tarnishes in air owing to the formation of their oxides or sulphides, and on being poured from a glass vessel leaves behind a tail of oxide or dross. Hence it should be strained through chamois leather to remove the dross, dust and other impurities and then either distilled in an iron retort or shaken with 5% nitric acid to remove traces of metallic impurities like lead, copper and other metals.

Because of its fickleness it is called *capala*. Since it is the king among other metals and minerals it is called *rasa rāja*. It carries all the *Śānskṛt* synonyms of Lord Śiva because it represents his essence. Mercury is the most important metal used in *Āyurveda* both *deha siddhi* (maintenance as well as promotion of positive health and prevention as well as cure of obstinate and otherwise incurable diseases) and *lauha siddhi* (alchemy or transmutation for ordinary metals into noble metals like gold and silver). This liquid metal is $13^1/_2$ times heavier than water. In colour, it is dazzling white and it is free from any smell or taste. It forms an amalgam with most of the metals except iron. Therefore, it should be stored and triturated only in containers of stone, glass mud, iron or enamel coated vessels. In view of its heavy weight, for alchemical processes, it is safer to keep it either in iron containers or in enamel vessels. Small quantities of this metal may, however, be stored in glass bottles.

Śānskṛt	:	Rasa, Pārada
English	:	Mercury
Latin Name	:	Hydrargirum
Hindi	:	Pāra
Chemical Formula	:	Hg
Sp. Gr.	:	13.6
Solidifies	:	39 °C
Boiling Point	:	357 °C

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Atomic weight : 200.6

Synonyms

The various synonyms of this metal indicate either its properties, appearance, form and colour or its mythological origin. The Synonyms like *Rudraretasa, Sivabīja, Haratejasa,* and *Rudraja* are to indicate its mythological origin. The significance of the term *Sivabīja* may be explained in another way also i.e. *Śiva* or *Rudra* is considered the most powerful God of *Hindus. Bīja* is again considered to be a highly essential and powerful substance of the living body. Thus the metal referred to by the term *Sivabīja* or *Haratejasa,* must be of high potency and efficacy and by virtue of this potency and efficacy it has found wide use and popularity in alchemy as well as in therapeutics. Synonyms like *Śāsi hemanibha, Galadrupyambha, Kālikārahitā* etc, indicate its form and colour. Those like *Rasa, Rasendra, Sūta, Miśraka, Sūkṣma, Sarvadhātupati* etc. indicate its physical and chemical properties. The synonyms like-*rasa, sūta, pārada, rasāyana, mahābahni sūkṣma* etc., indicate its pharmacological and therapeutic properties.

Availability

It is generally available near the volcanic hills. In the mines of Spain, it is available below 1600 ft., and California at about 2200 ft. deep. In the mines of Almend in Spain and in California the output of mercury is maximum. Mercury is also available in Yugoslavia, Peru, Mexico, Italy, China and Australia. Its chief ore cinnabar is available in Afghanistan, Ireland, Burma and China. Other mercurial ores are available in South Africa, Australia, New Zealand, France, Germany, Hungary, Portugal and Japan.

Generally mercury is found in the form of ores. The most important ore of mercury is *'Cinnabar* or meta cinnabar' in which it is in sulphide form the other important ores is 'Calomal' in which it is in Chloride from. (Hg_2 Cl_2). It is also fond mixed with Antimony and Sulphur. The important ores of this group are living stonite and worsenite. It is found in the from of oxide also. The important ors of this group is Montroiodide.

Ores of Mercury

1. Cinnabar (HgS), 2. Meta cinnabar (HgS), 3. Calomel (Hg_2 C_{12}), 4. Living stonite (2 Sb_2 S_3 HgS), 5. Moutroydite(HgO), 6. Falh ore, 7. Barsenite, 8. Gwadal kajrite, 9. Steel ore of mercury, 10. Liver ore of mercury, 11. Coralline ore of mercury, 12. Brick ore of mercury. Out of all the above cinnabar [(*Hingula* (HgS)] is the best ore (source) of mercury.

Market trend

In the recent days mercury is obtained from the following sources:

1. Double distilled mercury (manufactured by Emerck and other commercial companies).
2. Obtained by sublimation
3. Processed with 5% Nitric acid.
4. Processed with Potassium permanganate.
5. Obtained by reduced pressure.

Mercury some times occurs in free state as small globules scattered within the rock although the principle ore of mercury is a Red sulfide mineral called cinnabar, HgS. The bulk of the world's supply of mercury comes from Italy, Spain and U.S.A.

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Properties of Pārada in Specific forms

मुर्छित्वा हरति रुजं बंधनमनुभूय मुक्तिदो भवति । अमरीकरोति हि मृतःकोऽन्यः करुणाकरः सूतात् ।।
सुरगुरुगोद्विज हिंसापापकलापोद्भवं किलासाध्यम् । श्वित्रं तदपि च शमयति यस्तस्मात्कः पवित्रतरः सूतात् ।।
रसबंध एव धन्यः प्रारंभे यस्य सततमिति करणा । सेत्स्यति रसे करिष्ये महीमहं निर्जरामरणाम् ।।

र.र.स. १/३४-३६

The *Mūrchita* (swooned) *Pārada* destroys all the diseases, the *Baddha* (arrested) *Pārada* is responsible for emancipation and *Mṛta* (inactive) *pārada* brings about the immortality (long life). Can there be any other medicine which is more magnanimous than this mercury. If even the incurable *Switra Kuṣṭa* (Leucoderma) arising due to the sins by killing teacher, cow and *Brahmin*, is cured by this (*Pārada*), then what else is holier than this mercury.

He alone is fortunate who, before starting the mercurial operations (*Pārada Bandhana*), vows that he would bring about the agelessness and immortality to all the human beings after accomplishing the goal.

रसो रक्तो विनिर्मुक्तः सर्वदोषै रसायनः । संजातस्त्रिदशास्तेन नीरुजा निर्जरामराः ।।
रसेन्द्रो दोषनिर्मुक्तः श्यावो रूक्षोऽति चंचलः । रसायनोऽभवंस्तेन नागा मृत्युजरोज्जिताः ।।
देवैर्नागैश्च तौ कूपौ पूरितौ मृद्भिरश्मभिः । तदा प्रभृति लोकानां तौ जातावतिदुर्लभौ ।।
इषत्पीतश्च रूक्षांगो दोषयुक्तश्च सूतकः । दशाष्टसंस्कृतैः सिद्धो देहं लोहं करोति सः ।।
अथान्य कूपजः सोऽपि चंचलः श्वेतवर्णवान् । पारदो विविधैर्योगैः सर्वरोगहरः स हि ।।
मयूरचन्द्रिकाच्छायः स रसो मिश्रको मतः । सोऽप्यष्टादश संस्कारयुक्तश्चातीव सिद्धिदः ।।
त्रयः सूतादयः सूताः सर्वसिद्धिकरा अपि । निजकर्म विनिर्माणैः शक्तिमन्तोऽतिमात्रया ।।
एतां रसमुत्पत्तिं यो जानाति स धार्मिकः । आयुरारोग्य संतानं रससिद्धिं च विंदति ।।

र.र.स. १/६९-७६

The first one, *Rasa* is red in colour and devoid of all the blemishes. Gods became ageless and immortal after consuming it. The *Rasendra* is without blemishes, has *Śyāva* (kapila-brown) colour, is dry (rough) in nature, extremely unstable (pure) and has *Rasāyana* qualities. The *Nāga* people who consumed this, became free from senility and death. Later the Gods and *Nāgas* shut off the wells of *Rasa* and *Rasendra*, filling them with mud and stones. Since them human beings are unable to get these *Rasa* and *Rasendra*, from those wells. The Mercury which is called *Sūta*, has little yellow in colour and is rough and has blemishes. If this is consumed after subjecting to *Aṣṭadaśa Saṁksāra* (18 processes) the body becomes strong like iron.

The one which is available in the other well is called *Pārada*, which is very unsteady and white in colour. If various *yogas* (combinations) prepared using this *Pārada* and is consumed (after purification), eradicates all the diseases. The *Pārada* which has got the lustre of peacock's wing, is called *Mīśraka*. This too, if used after subjecting to 18 processes, can become very beneficial. The varieties such as *Sūta, Pārada* and *Mīśraka* are basically beneficial, valuable and if they are subjected to various specific processes, they can assume greater power. A virtuous person, who understands the origin of mercury as said above, would achieve the longevity, possesses health, many children and accomplishment in mercurial process (*Rasa Siddhi*).

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Method of extraction of Mercury from its minerals

According to *Āyurvedic Rasa texts,* mercury may be obtained from its main *Khanija, Hingula* by the following methods:-

1. *Damaruyantra* process
2. *Kaṇḍūkayantra* process

1. Damaruyantra process : In this process mercury is triturated with *Nimbu* (lemon) or *Ārdraka Juice* and made into small, flat, round pieces which after being dried are kept in an earthern pot covered with another pot of the same size and sealed at the joints with cloth & clay in such a way so as to make it air tight. Then heat the lower vessel with a strong heat and cool the upper vessel with wet cloth so as to condense mercury fumes in the upper vessel. In the end allow the apparatus to cool by itself and open it to collect mercury from the upper vessel of the apparatus. If the required quantity of mercury is not obtained repeat the process once more to collect the remaining portion of mercury from *Hingula.*

2. Kandukayantra Process : In this process powdered *Hingula* is spread all over the cloth, which is then rolled like a ball and put into a fire. It should be covered with a big hollow earthen pot from all sides leaving only one side open for oxygen intake & sulphur-dioxide exit. By this process mercury evaporated by heat is condensed in the big hollow earthen pot due to the low temperature. The mercury thus condensed in the upper part of the covering pot may be collected.

These processes yield 60-70% of mercury from the *Hingula* (cinnabar). As these methods are crude greater loss of mercury is expected in these processes. Advanced modern chemical methods increase the yield upto 83%. The yield of mercury from *Hingula* depends mainly on the purity of the mineral *(Hingula)* also.

Superiority of Hingulottha Pārada

As per the *Āyurvedic* concept Mercury extracted from *Hingula* is considered to be the best, because it is free from various types of *doṣas* (*Kancuka* and *Yougic doṣas*) Hence the same does not need any further *samskāra* (processing) for their removal, and could be used even without subjecting it to the eight *samskāras,* and is claimed to be capable of performing all the actions attributed to it. Moreover according to *Rasaprakāsa sudhākara* mercury extracted from *Hingula* may possess all those properties which are seen in *Ṣadguṇajārit Pārada.* Thus it is considered highly superior to ordinary mercury from the purity as well as potency point of view.

Varieties

रसो रसेन्द्र सूतश्च पारदो मिश्रकस्तथा । इति पंच वियो जातः क्षेत्रभेदेन शम्भुजः ।। र.र.स. १/६८

The semen of *God Śiva*-the *Pārada*, due to different specific origin of availability, distinguished itself in to five types viz. *Rasa, Rasendra, Sūta, Pārada and Mīśraka*. The varieties of mercury described in various texts are based on the following factors. 1. Depending on colour, 2. Depending on the source of origin.

Depending on colour

As soon as mercury is taken out of *Kūpas* it has been classified into four varieties on the basis of its colour or lustre :

1. *Śweta* or white-*Brāhmaṇa*-useful in *śwetakarma*

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2. *Rakta* or red-*Kṣatriya*-useful in therapeutics
3. *Pita* or *Yellow-Vaisya*-useful in alchemy or gold making
4. *Kṛṣṇa* or black-*Śudra*-Useful in the maintenance of health

These are found in *'Rasaprakāsa sudhakara'*.

Depending on the source of origin

Depending upon the place of orgin mecury has been divided into five varieties, viz.

1. *Rasa-Rakta*-without all types of impurities
2. *Rasendra-Śyava*-without impurities
3. *Sūta-Iṣatpīta*-with impurities-*Deharogahara*
4. *Pārada-Śweta*-with impurities-*Sarvarogahara*
5. *Miśrakia-Mayūracandrikacchāya* with various impurities-*sarvasiddhida.*

The properties of all these varieties depend mainly on the place or the source of origin from which they are obtained and also on the combination or contact with the other metals 7 minerals inside the mine.

Properties of each variety

Rasa- *Rasa* is said to be *Rakta* or red in colour, free from all types of *Doṣas* (impurities) and claimed to possess *Rasāyana* property, by virtue of which it is capable of keeping the body free from all kinds of diseases and also from *Jarā* and *Mṛtyu.* It shows its effects not only on human beings but on *Devas,* who are made free from all these evils. All the metals & minerals are dissolved in it when they come in its contact.

Rasendra-*Rasendra* is said to be *Śyāma* (blackish) in colour, *Rūkśa* (rough) to the touch, *Aticancala* (highly mobile) and free from *doṣas* (impurities). It also possesses *Rasāyana* property. And by virtue of this property even *Nāgas* (snakes) became free from *Jarā* and *Mṛtyu.* It is considered to be the king of all the metallic and mineral drugs and hence the name *Rasendra* is given to it. *Rasa* and *Rasendra-varieties* are rare now.

Sūta- *Sūta* is said to be light yellow in colour, *Rūksa* in appearance and mixed with *doṣas* (impurities). If it is used after subjecting it to *Aṣṭādaśa samskārās* it can make the body strong and free from diseases and can transform base metals into noble metals. As it is capable of making *Dehasiddhi* and *Lohasiddhi* the name *Sūta* is given to this.

Pārada-*Pārada* is said to be obtained from another *Kupa* (mine) and is *cancala* (mobile) & white in colour. It is capable of curing all diseases if it is used along with other *Yogas* (preparations). As it may save persons from severe diseases when used internally the name *Pārada* is given to this variety.

Miśraka-*Miśraka* is that which possesses shades of different colours like the peacock quill and after undergoing 18 *Samskāras;* attains the power of delivering all types of *siddhies.* As it possesses the power of dissolving, all metals and mixing with them the name *Miśraka* is given to it. The different shades of colours seen in this variety are the result of the mixture of the different metals which are mixed with it from the source itself.

Doṣas

विषं वन्हिर्मलश्चेति दोषा: नैसर्गिकास्त्रय: रसे मरणसन्तापमूर्च्छानां हेतव: क्रमात् ।
यौगिकौ नागवंगौ द्वौ तौ जाडचाध्मानकुष्ठदौ ।।

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औपाधिका: पुनश्चान्ये कीर्तिता: सप्तकञ्चुका: । भूमिजा गिरिजा वार्जा द्वे च द्वे नागवङ्गजे ।। र.र.स. ११/२१-२२
पर्पटी पाटनी भेदी द्रावी मलकारी तथा। अन्धकारी तथा ध्वाङ्क्षी विज्ञेया: सप्त कञ्चुका: ।।
र.र.स. ११/२५

In the nature, pure mercury is seldom available. It is adulterated on contaminates with other elements which make this metal more poisonous for the body. Before mercury is made digestible, assimilable and acceptable to the tissue cells, it is necessary to make this metal free from these *doṣas* or defects which are either physiological or therapeutic in nature.

Mercury, according to ancient texts, possesses the following *doṣas* (impurities)–

1. *Naisargic doṣas* - 3,5,8 and 9.
2. *Yougic doṣas* - 2.
3. *Oupādhic* or *Kancuka, doṣas* - 7.

Thus in ancient texts the impurities found in mercury have been classified into three groups according to their nature, Viz. 1. *Naisargic doṣas* are the those which come or are present in the mercury from nature of natural sources. According to different texts their number varies from 3 to 9. In most of the texts three *Naisargic doṣas* are described as follows along with their effects:–

1- a. Naisargic doṣas	1. *Viṣa*	--	*Mrtyukara*
(*Rasa Ratnasamucchaya*)	2. *Vahni*	--	*Santāpakara*
	3. *Mala*	--	*Mūrcchākara*

In *'Rasendra Mangala', Rasa Prakāśasudhākara'* and *'Rasakaumudi' five naisargic doṣas* along with their effects have been described as follows :

b. *Naisargic doṣas*	1. *Mala*	--	*Murccha*
	2. *Viṣa*	--	*Mṛtyu*
	3. *Vahni*	--	*Daha*
	4. *Gurutwa*	--	*Śula*
	5. *Cāpalya*	--	*Asthiratwa*

In *'Rasaprakāśasudhākara, Mada* and *Darpa* have been mentioned in place of *Gurutwa & Capalatwa,* which causes *sphoṭa* and *śirobhrama* respectively. In *Rasakāmadehenu, unmāda* and *śaila doṣas* are described as the fourth and fifth *naisargic doṣas.*

c. *Naisargic doṣas*	1. *Viṣa*
	2. *Vahni*
	3. *Mala*
	4. *Guruṭwa*
	5. *Uddīnatwa*
	6. *Kouṭilya*
	7. *Anāvarta*
	8. *Śankara*
	9. *Ṣaṇḍatwa*

The last four *doṣas* are found in this text only. The fifth one *Uddīnatwa* is mentioned in place of *Cāpalya* mentioned in *Rasendramangala.*

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2. *Yougic doṣas :* About *Yougic doṣas* there is not much difference of opinion among ancient scholars except in their name. In *Rasendra Mangala, Yougic doṣas* are described as *Oupādhic doṣas.* Thus as regards their name and number there is no difference of opinion. They are–

1. *Nāgaja – Jāḍya, Ādhmāna, Gulma*
2. *Vangaja – Kuṣṭha, Galagaṇḍa.*

Usually these *doṣas* are mixed with mercury by traders from the commercial point of view with a view to increase its weight as these metals are of low cost. Of these *Nāgadoṣa* (lead impurity) is more common. Though these are mixed from commercial point of view however, when they are mixed they produce some toxic effects too like *Jāḍya, Ādhmāna* and *Gulma* from *Nāga doṣa* and *Kuṣṭha & Galagaṇḍa* from *Vanga doṣa.*

3. *Kancuka or oupādhic doṣas :* About *oupadhic* and *kancuka doṣas* there is some difference of opinion amongst ancient scholars regarding their name and source. But they are seven in number according to all. About their source it has been said in the texts that they are imparted to mercury either from the earth or mountain (*giri*), water (*vari*), or from minerals with which its ores are found associated. According to *'Rasaratnasamuccaya'* two *kancuka doṣas* are from *Nāga* (lead) and two from *Vanga* (Tin) while according to R.P.S. One each from *śulva* (copper), *Ayas* (Iron), *Nāga* (lead) and *Vanga* (tin). From the modern point of view *aupadhic* or *kancuka doṣas* are the impurities of mercury which are seen as a thin layer covering it even at the normal atmospheric temperature. Thus *kancuka* is a layer which is found to cover the portion of mercury exposed to the atmosphere. This is because of the slow chemical action taking place continuously in the mercury due to the presence of traces of elements in it. These *kancuka doṣas* according to ancient texts, are regarded as poisons since they produce some diseases in the body.

The *Kancuka doṣas* along with their sources and effects are described as follows :

S.N. Name	Source	Effects
1. *Parpaṭi*	*Mṛṇmaya (Pṛthvi)*	*Kuṣṭha, Ṣoṣiṇī*
2. *Pāṭinī*	*Pāṣāṇaja (Girija)*	*Jāḍya, Vidāriṇī*
3. *Bhedī*	*Jalaja (Vārija)*	*Vali-palita-khālitya* or *Vātasanghāta, Malabhedana*
4. *Drāvī*	*Nāgaja (Śyāmā)*	*Mahākuṣṭha, Śwetakuṣṭha, Udara, Kāmalā, Pāṇḍu, Prameha, Śarīradhātudrāvaka*
5. *Malakāri*	*Nāgaja (Kapālikā)*	*Dadru, Gajacarma, Doṣavardhaka*
6. *Dhwānkṣī*	*Vangaja (Kapāli)*	*Vīryakaranī, Swara Pārusyakara*
7. *Andhakārī*	*Vangaja (Kalikā)*	*Marmaccheda, Vastiruja, Andhatwa Janana.*

Thus in short it may be said that *mercury,* according to different texts, possesses seven, nine, or twelve *doṣas* (impurities) which either come from nature or get mixed artificially or are produced due to the chemical action inside the earth or outside in the atmosphere. These impurities of *mercury* which come from any sources are likely to produce some toxic effects on the body if not removed properly before use internally.

As mercury was considered one of the most important powerful therapeutic agents for achieving *Dehaśiddhi* (proper metabolic functioning of the body), ancient *Āchāryas* observed minutely the various types of impurities of mercury and their toxic effects on the body and seemed to take much pain and interest in removing or minimising these to the extent possible during that time. This is evident from the statements made by different scholars in different texts-that mercury with impurities is poi-

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son while without impurities is *Amṛta* (highly effective again to diseases decay and death as well as in promoting normal health (vigour). They further stated that because of this it should be purified properly. They did not become satisfied with only purification and so they advised its potentiation too. They have mentioned specific drugs for removing specific type of impurities as follows :

Impurities	*Drugs*
1. *Mala doṣa*	*Kumāri, Ankola, Āragvadhamula*
2. *Vahni doṣa*	*Triphalā, Āragvadha, Citraka*
3. *Viṣa doṣa*	*Citraka, Triphala*
4. *Kouṭilya doṣa*	*Kṣāradwaya, Kṛṣṇadhattūra*
5. *Anāvarta doṣa*	*Lavaṇās*
6. *Samkara doṣa*	*Navasāra*
7. *Uddīnatwa doṣa*	*Dhattūra*
8. *Gurutwa doṣa*	*Trikaṭu*
9. *Ṣaṇḍhatwa doṣa*	*Rajani, guḍa, sarṣapa*
10. *Giri doṣa*	*Trikaṭu, Kākamāci*
11. *Kṣetra doṣa*	*Gokarṇa (palāśa) rasa*
12. *Asahyāgni*	*Gokṣūra*
13. *Saptakancuka doṣa*	*Kumāri, Citraka, Rakta Sarṣapa, Bṛhati or Triphala Kasāya, Trikaṭu & Kārpāsapatrarasa*
14. *Nāga vangaja Kancuka doṣa*	*Vāsaka, Bibhitaka*

Effects of impure mercury

It is said in texts that impure mercury, if used internally, may produce various diseases in the body viz, *Vidāha, Krmi, Kuṣtharoga, Agnimāndya, Aruci, Vami, Jādya* and even death. Thus instead of doing good it may do harm to the body and hence should be purified before use.

General purification of mercury

For general purification some texts have recommended the *Pātana* process i.e. by sublimation or distillation it may be purified. The distillation method of purification is used in modern science also. In some other texts only filtration through double or four fold cloth for several times (seven to twenty one times) is also recommended for the purification of mercury. In *'Rasataranginī'* several methods of purification have been described, of these the following method is the commonest. Mercury is to be rubbed with equal part of lime powder for 3 days and filtered through cloth. The filtrate (mercury) is now mixed with an equal part of *laśuna* and ground till the paste becomes black. In the end it should be washed with hot water and the purified mercury is collected in other texts scholars have recommended *Hingulottha* mercury for medicinal preparations instead of making general purification of mercury and then using it for medicinal preparations.

Physical properties

Some of the physical properties of mercury are described through its synonyms viz-

Capala, Rasa, Galad-Rupyanibha, Misraka, etc., Further description regarding these properties is found in the account of its form or appearance i.e. *Antah sunīla, Bhirujjwala, Sūryapratima prakāśa.*

Thus according to Ayurvedic descriptions mercury is a quick moving element, which is a white liquid like melted silver. It can swallow or dissolve all the other metals except iron very easily and quickly. It can make alloys or amalgams with other metals. In its liquid and pure form it looks as

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bright and white as the midday sun from outside and with a blue tinge from inside. But when it is mixed with impurities it looks smoky grey or like a mixture of colours and hence such mercury is considered inferior.

Pharmacological properties

Rasa	:	*Ṣad Rasa*
Guṇa	:	*Snigdha, Sara*
Karma	:	*Yogavāhī, Rasāyana, Atiṛsya, Balya, Vājīkara, Dṛṣṭibalaprada, Vayastambhakara, Bhuktimuktiprada, Puṣṭikara, Dīpana, Agnikārī, Āyuṣkara, Kāmāgnisāndhukṣana, Sarvāmayahara, Dehasidhikara, Lohasiddhikara, Khe-gatiprada, Puruṣārthacatustayaprada, Śodhana, Ropaṇa, Kṛmighna.*
Effect on Doṣa	:	*Tridoṣaghna*

Therapeutic Uses

Kṛmi, Kuṣṭha, Sarvavidhakuṣṭha, Akṣiroga, Vātaroga, Valīpalitaroga, Tridoṣajaroga, Sarvaroga, Tāpatrayajanyaroga, Pāpajaroga.

Saṁskāras of Pārada

स्वेदनमर्दनमूर्च्छोत्थापनपातननिरोधनियमाश्च। दीपनं, गगनग्रासप्रमाणमथ चारणविधानं च।।
गर्भद्रुतिबाह्यद्रुतिजारणरसरागसारणं चैव। क्रामणवेधौ भक्षणमष्टादशधेति रसकर्म।।

र.हृ.त. २/१२

स्यात् स्वेदनं तदनु मर्दनमूर्च्छनं च उत्थापनं पातनरोधन नियामनानि। सन्दीपनं गगन भक्षणमानमत्र संचारणा तदनु गर्भगताद्रुतिश्च।। बाह्यद्रुति सूतकजारणा स्याद् रागस्तथा सारणकर्म पाश्चात् संक्रांमणं वेदविधीःशरीरे योगस्तथाष्टादशधाऽत्र कर्म।।

र.र.स. ९/१६-१७

According to *Rasa* literature there are 18 or 19 *Saṁskāras* of mercury. Those who mention 19 *Saṁskāra* include *''Anuvāsana''* as an additional 19th *Saṁskāra. Dhuṇḍhukanāth* was the first scholar to add *Anuvāsana Saṁskāra* in the list of 18 *Saṁskāras* and recommended it as a 19th *Saṁskāra* which has been followed by the following authors in their respective texts like *'Rasaratnākara'* by *Nityanāthasiddha* and *'Ayurveda Prakāśa* by *Mādhava Upādhyāya.*

Though 18 or 19 *Saṁskāras* have been mentioned in different texts from their utility point of view the first 8 *Saṁskāras* are important and common for alchemical as well as therapeutic purposes, and the remaining *Ten Saṁskāras* are mainly useful for alchemical *(lohavedha)* purposes. Thus from the therapeutic point of view the first 8 *Saṁskāras* are highly important, as they help on removing the external and internal impurities of mercury and help in its potentiation too and hence they are described in detail in almost all the texts.

The eighteen *Samskāras* of *Rasarāja* (mercury) are as follows :

1. *Swedana*—Application of heat through boiling liquid.
2. *Mardana*—Grinding with prescribed drugs and liquids.
3. *Mūrchana*—Swooning/disappearance of its form by grinding.
4. *Utthāpana*—Regaining to its original form by hot washing or sublimation.
5. *Pātana* *Urdhwa* – Upward } Sublimation
   Adhah – Downward

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Tiryak – Distillation

6. *R/Bodhana*—Potentiation (awakening of its properties)
7. *Niyamana*—Restraining through boiling liquids.
8. *Dīpana (Samdīpana)*—Appetisation (increasing its metal-consuming power).
9. *Gagana Bhakṣaṇa Māna*—Specifying the quantum of *grāsa* (mica) to be consumed.
10. *Cāraṇa*—Swallowing (consumption of *grāsa* by mercury).
11. *Garbha Druti*—Internal liquifaction of *grāsa.*
12. *Bāhya Druti*—External liquifaction of *grāsa.*
13. *Sāraṇa Karma*—Process of preparing mercury for *Krāmaṇa.*
14. *Rāga (Rañjana)*—Colouring/dyeing of mercury.
15. *Sāraṇa Karma*—Process of preparing mercury for *Krāmaṇa.*
16. *Samkrāmaṇa*—Penetration/attacking of mercury for transformation of metals/body.
17. *Vedhakarma*—Transmutation of metals/body.
18. *Śarīrayoga*—Preparation of mercury for internal use.

It is advised that persons whose *Marmasthānas* (vital organs) are injured and who are the victim of *Kṣāra* (alkali) and *Agni* (fire) *karmas* should avoid its internal use.

On the basis of experimental work done by various scholars at various centres it is evident that mercury and its preparations prepared after subjecting it to the first eight *Saṁskāra,* are found less toxic and therapeutically more potent. Its thermostable property is also found raised. The details regarding the eight *Saṁskāra* are given below.

Eight Saṁskāra of Mercury

Almost all the workers are unanimous regarding the names of the eight *Saṁskāra,* Viz:–

1. *Śwedana*
2. *Mardana*
3. *Mūrcchana*
4. *Utthāpana*
5. *Pātana*
6. *R (B) Odhana*
7. *Niyamana*
8. *Dīpana*

(9. *Anuvāsana* - Potentiation)

For performing the above mentioned *Saṁskāras* different types of drugs, apparatuses, procedures and purposes have been mentioned in different texts. On the basis of literary evidences it may be said that there are only three processes to be adopted in all the eight *Saṁskāras,* viz. (1) Swedana-which is done in three *Saṁskāras*-namely-Swedana, *Niyamana* and *Dīpana.* (2) *Mardana*-is done in two *Saṁskāras* namely-*Mardana* and *Mūrcchana* and (3) *Pātana* either *Ūrdhwa, adha* or *Tiryak* is done in two *Saṁskāras* namely-*Utthāpana* and *Pātana.* For *Rodhana* or *Bodhana* no special process is needed. For this mercury is simply kept in a bottle with saline water for 3 days.

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Purpose, Process, Apparatus and time required for each Saṁskāra

Sl. No.	Name of *Saṁskāra*	Purposes of *Saṁskāra*	Process used	*Yantras* required	Duration
1.	*Swedana*	*Doṣa Śaithilya Kāraka*	*Swedana* (heating through liquid bath)	*Dolāyantra*	3 days
2.	*Mardana*	*Bahirmala Vināśana*	*Mardana*	*Taptakhalva Yantra*	3 days
3.	*Mūrchana*	*Naisargika doṣa Nāsana*	*Mardana*	*Khalva Yantra*	5 days or till *Naṣṭapiṣṭatva* of *Pārada*
4.	*Utthāpana*	*Pūtidoṣa Nivṛtti, Swarūpāpādana*	*Prakṣālana & Pātana*	*Urdhva Pātana Yantra*	Till *pārada* is re-gained
5.	*Pātana*	*Yaugika doṣa* or *Sarvadoṣa nāśana*	*Ūrdhwa, Adhaḥ & Tiryakpātana*	*Ūrdhwa, Adhah & Tiryakpātana Yantra*	2-3 weeks
6	*R/Bodhana*	*Ṣaṇḍhatva Nivṛtti Śaithilya/ Mandatva Nāśana, Āpyāyana*	*Dravasthāpana*	*Kācakūpī*	3 days
7	*Niyamana*	*Capalatva Nivṛtti*	*Swedana*	*Dolāyantra*	3 days
8.	*Dīpana*	*Bubhukṣīkaraṇa Mukhakaraṇa Grāsārthīkaraṇa*	*Swedana*	*Dolāyantra*	3 days

According to the reference of *'Rasendra Cintāmaṇi'* quoted in *'Āyurveda Prakāśa'*, 1000 lemon fruits are advised to be used in this process and grinding with lemon juice may be done for 20 days.

Herbal Drugs and Their Groups Useful for Mercury Process : In *'Rasa Ratna Samuccaya'* only *'Rasamūlikā'* group of herbal drugs is mentioned in which 53 herbal drugs have been included, and these have been advised to be used for applying *'Bhāvanā'* and *'Śwedana'* to *Pārada* and also for pasting/coating crucibles. Besides. *'Rasamūlikā'* group, 20 more groups of herbal drugs are found described in other *Rasa texts,* which are found useful in some way or other for different processes of *Pārada.*

Out of these eight *Saṁskāras* the first five *Saṁskāras* are done with a view to remove the *doṣas* (impurities) of *mercury* where as the later three *Saṁskāras* help in the *potentiation* of *Pārada.*

Śwedana

क्षाराम्लैरोषधैर्वापि दोलायन्त्रे स्थितस्य हि। पचनं स्वेदनाख्यं स्यात् मलशैथिल्यकारकम्।।

र.चि. ४/८१

क्षाराम्लैरौषधैर्वाऽपि दोलायंत्रे स्थितस्य हि। पचनं स्वेदनाख्यं स्यान्मलशैथिल्यकारकम्।।

र.र.स. ८/५९

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Śwedana is the process in which *Pārada* is boiled in *Kṣāra* (alkalies), *Āmla* (sour substances) etc. or in juice or decoction of any other drugs in *Dolāyantra*. This process helps in loosening the *Malas* (blemishes) present in the *Pārada*.

Ingredients : 1. Mercury one part

2. *Kalkadravyas* $^{1}/_{16}$th part each *Āsurī, Paṭu (Saiṇḍhava), Kaṭuraya (Sunṭhī, marica, pippalī) Citraka, Ārdraka, Mūlaka*

3. Liquid– *Kānji*–Sufficient for three day's *Swedana karma*

Method : Powder the *Kalka dravyas* and prepare a smooth paste by adding *Kānji* and grinding well. Now place mercury gently into the *Kalka* which is kept over the *Kadalīpatra* and make a *Vasṭra pottalī* which is to be suspended inside the *Kānji* liquid already filled in *Dolāyantra* upto $^{3}/_{4}$th and heat it gently (till it boils) for three days. According to some scholars *Kalka* and *Kañji* should be changed daily. On the 4th day take out *Poṭṭalī* from *Dolāyantra* and collect *mercury* from the *kalka* by washing it with hot water.

Equipment : Dolāyantra

Uses : Malśaithilyakarana (Liquifying of impurities)

Duration : 3 days

Mardana

उदितैरोषधैः सार्धं सर्वाम्लैः काञ्जिकैरपि। पेषणं मर्दनाख्यं स्याद् बहिर्मलविनाशनम्।।

र.चू ४/८२

उदितैरौषधैः सार्धं सर्वाम्लेः कांजिकैरपि । पेषणं मर्दनाख्यं स्याद् बहिर्मल विनाशनम् ।। र.र.स. ८/६०

Grinding *Pārada* along with various drugs used for *Mardana* process, adding all types of sour substances, and *Kāñji*, is called the operation of *Mardana*. The external *malas* (blemishes) are destroyed by this process.

Ingredients : 1. Mercury 1 part

2. *Kalka dravayas* 1/16th part each (*Guḍa, Dagdhachūrṇa, Lavaṇa (saindhava), Gṛhadhūma, Isṭikācūrṇa* and *Āsurī*)

3. Liquid-*Kānjī* as required

Method : Powder the *Kalka dravyas* and mix them with mercury and grind well by adding *Kañjī* in *taptalohakhalva. Mardana* should be continued for three days and maintain the temperature of *Khalva* at about 65°C.

Equipment : Taptakhalva

Uses : Bahirmalavināśana (to remove external impurities)

Duration : 3 days.

Mūrchana

मर्दनाऽऽदिष्टभैषज्यैर्नष्टपिष्टत्वकारकम् । तन्मुर्छनं हि वंगादिभूज कंचुकनाशनम् ।। र.र.स. ८/६१

Pārada is ground with the drugs used for *Mardana* to bring about a condition called *Naṣṭa piṣṭa* homogeneous paste. This process is known as *Mūrchana*, which helps in removing the *doṣas* (*blemishes*) like *Nāga* and *Vaṅga* and also *Bhūmija* as well as *Kañchuka* type.

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Ingredients : 1. Mercury 1 part
2. *Kalkadravyas* 1/16th part each *Triphala, (Harītaki, Bibhitaki* and *Āmalakī Cūrṇa, Citraka* and *Kumāri.*

Method : Powder first two drugs and mix them with mercury and add *Kumarīswarasa* in required quantity so that it could be rubbed well till *mercury* attains *Naṣṭapiṣṭa* stage. Generally, this stage is achieved by rubbing mercury with the above drugs continuously for 5 to 6 days.

Equipment : Khalvayantra

Uses : Doṣasūnyakarṇa vangāhibhūmikancukanāśana (to remove natural impurities)

Duration : Till *Naṣṭapiṣṭastage* is achieved. Some scholars suggest the use of *Taptakhalva* for this *Saṁskāra* also but on the basis of experience ordinary *Khalva* should be used, as in *Tapta khalva* it is difficult to achieve complete *Naṣṭapiṣṭatwa* of mercury.

Utthāpana

स्वेदातपादि योगेन स्वरूपापादनं हि यत् । तदुत्थापनमित्युक्तं मूर्छाव्यापतिनाशनम् ।। र.र.स. ८/६२

The *Pārada* which has attained the state of *Naṣṭapiṣṭatva* in *Mūrchana saṁskāra* is brought back to its original state by the help of *śwedana* (boiling) in *Dolāyantra* or by keeping it under the sunrays or by any other process. This retrieval of *Pārada* is called *Utthāpana Saṁskāra*. This helps in eradicating the unwanted qualities acquired during the process of *Mūrchana.*

Characteristics of Naṣṭapiṣṭa

स्वरूपस्य विनाशेन पिष्टत्वाद् बंधनं हि यत् । विद्वाद्भिर्निजितः सूतो नष्टपिष्टो स उच्यते ।। र.र.स. ८/६३

Naṣṭapiṣṭa is the condition, which is acquired by the *Pārada*, when it becomes like paste, leaving its original state (like mobility etc). This is achieved by grinding *Pārada* with various drugs.

Ingredients : 1. *Mūrcchita* mercury mixture
2. *Uṣṇodaka*
3. *Uṣṇa Kāñjika*

Method : Mūrchita mercury mixture should be mixed either with hot water or with *Kāñjika drava* and washed gently by adding two-three times hot liquid so as to regain the mercury in its original form. If the whole mercury is not regained by this washing process the paste may be dried and put in the *Pātana yantra* to get the mercury by sublimation process.

Equipment : Trays, and *Pātana yantra* or *Damaruyantra.*

Uses : Murcchā Vyāpattināśana, Pūtidoṣa Nivṛtti, and *Swarūpāpādana* (to regain mercury in its original form).

Duration : Though no specific time limit is mentioned. But it may be taken till the whole mercury is regained in its original form. Sometimes only washing with hot water or hot *Kanjika* is sufficient but when this process does not yield the whole mercury *Pātanayantra* process may also be needed. One time *Pātana* (sublimation) is sufficient for this purpose. The advantage of the *Pātana* process is removal of *Nāgavangaja* impurities from mercury, which is sometimes not possible with washing only. According to *'Rasendracūḍāmani'* when *Pātana* is done mercury is obtained from the upper vessels of the apparatus.

Pātana

उक्तौषधैर्मर्दितपारदस्य यंत्रस्थित स्योर्ध्वमधश्च तिर्यक् । निर्यातनं पातनसंज्ञमुक्तं वंगहिसम्पर्कज कंचुकघ्नम् ।।
र.र.स. ८/६४

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The *Pārada* is ground with specific drugs and it is subjected to *Pātana* (sublimation) in upward, downward and oblique (*Ūrdhwa, Adhah* and *Tiryak*) direction by heating in *Ordhwa pātana yantra, Adhapātanayantra* and *Tiryakpātana yantra*, respectively. This process is called *Pātana*. *Nāga* and *Vaṅga doṣas*, which are artificially mixed (adulterated in *Pārada*) are removed with the help of the *Pātana Saṁskara*.

Ingredients : 1. *Utthāpita mercury* one part
2. Copper foils 1/3rd part *(Gomūtra śodhit)*
3. *Nimbūswarasa*-as required to make the *piṣṭī* of mercury and *copper*.

Method : Copper foils (purified) are cut into pieces and mixed with *Utthāpit* mercury and rubbed adding lemon juice. The *Mardana* should be continued till the *Pāradapiṣṭi* is made. This *Piṣṭi* is now put into the *Pātana yantra* specially prepared for the purpose, which after sealing properly given strong heating. The vapours of mercury thus obtained are condensed through a condenser fitted to the *Pātanayantra* so as to get the mercury from the *Sulvapiṣṭi*. The whole process i.e. preparation of *Sulvapiṣṭi* and its *Pātana* should be repeated 3 times. According to some texts three types of *Pātana* i.e. *Urdhwa, adhah,* and *Tiryak* should be done instead of repeating the same *pātana* process three times.

Equipment : Specially prepared *Pātanayantra, distillation apparatus, Khalvayantra,* conical flask etc.

Uses : To remove lead and tin *(Yougikadoṣa* or *Kṛtrima doṣas)* from the mercury which are found mixed from nature or afterwards added by traders from the commercial point of view.

Duration : In the *Pāṭana* process though, the texts have not mentioned any time *Śulvapiṣṭi* is to be made before subjecting it to *Pātana* process which requires about 5 to 7 days depending upon the force and grinding time. The *Pātana* process through improved and modified *pātana yantra* takes even less than one hour. The process should be repeated three times.

Note : According to the description of *Rasa Hṛdayatantra, śulvapiṣṭi* should be subjected to *Pātana* process to make the mercury free from *Nāgavangaja* impurity. But nothing is said about repetition of *Pātana* process, which indicates that during his time only one *Pātana* was considered sufficient to remove the above impurities but later texts like *'Rasārṇava'* or *'Rasasāra'* have recommended two types of *Pātana* process-i.e. *Ūrdhwa & Adhahpātana,* which indicate that according to their views one *Pātana* was not considered sufficient for the above purpose; so they introduced the idea of double *Pātana* or sublimation. But still later texts like *'Rasendracūḍāmaṇi,' 'Rasendra cintāmaṇi', 'Rasaprakāśa sudhākara, 'Rasa Ratna Samucaya, Āyurveda Prakāśa* etc., have mentioned the idea of *Tiryak Pātana* (distillation) also and thus according to their views Triple distillation was necessary for removing the above *doṣas* (impurities) from the mercury completely.

Rodhana/Bodhana

जलसैंधवयुक्तस्य रसस्य दिवसत्रयम् । स्थितिरास्थापनी कुम्भे याऽसौ रोधनमुच्यते ।। र.र.स. ८/६५

Saindhava lavaṇa is taken in an earthen pot, with water and *Pārada* is kept in it for 3 days. This process is known as *Rodhana*, by which *Pārada* gains potency.

Ingredients : 1. *Pātita mercury* one part
2. *Saiṇḍhava lavaṇa* $^1/_{16}$th part
3. Water to make saturated solution

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Method : Prepare a saturated solution of *Saindhava lavaṇa* in water and fill it in *Kācakūpī,* put mercury (obtained from *Pātana* process) in the solution and keep *Kūpi* undisturbed for three days.

Equipment : Kācakūpi or *Kumbha*

Uses : Mandaviryatwa or *Ṣaṇḍhatwanivṛthi,* which comes into the mercury by *Mardana, Mūrcchana* and *Pātana* process. In other words to lessen the sickened stage of mercury or to make it more active. In some texts the purpose is said to be *Mukshakaratwa,* which means increase in its amalgamation power. The term *Vīryānayana* is also used in this context, which means to regain its potency.

Duration : 3 days

Note : The proportion of *Saindhava* and water should be 1:5. The term *''Sṛṣṭyambuja''* used in this process should be refered for *Saindhava vāri.*

Niyamana

रोधनाल्लब्धवीर्यस्य चपलत्व निवृत्तये । क्रियते पारदे स्वेदः प्रोक्तं नियमनं हि तत् ।। र.र.स. ८/६६

Due to the above *Rodhana* process, *Pārada* possesses potency but regains its mobility. In order to remove this mobility, *Pārada* is subjected to *Śwedana* process. This operation is called *Niyamana.*

Ingredients :

1. *Ṣodhita mercury*	One part	
2. *Kalka Dravayas*	1. *Paṇ (Tāmbūjapatra)*	$^1/_{16}$th part
	2. *Lāsuna*	,,
	3. *Saindhāva*	,,
	4. *Mārkava (Bhṛngarāja)*	,,
	5. *Karkoṭī*	,,
	6. *Cincā*	,,
3. *Drava Dravya*	– *Kānji*-as required	

Method : Prepare a smooth paste of all *Kalka dravyas,* put it over *Kadalīpatra* and place the mercury over the paste. Now keep the whole thing in *Caturguṇa vastra* and prepare a *poṭṭalī* which should be suspended in *Kānjīdrava* filled in *Dolā yañtra.* Continuous heat should be applied to *Dolā yañtra* for 3 days to give wet fomentation to mercury for its potentiation. After the process is over take out the *Poṭṭalī* from *Yañtra* and collect mercury from *Kalka* by washing it with hot water carefully.

Equipment : Dolā yañtra, Heating device.

Uses : Capalatwa Niyamana i.e. to restrain its quick moving property to the required extent.

Duration : 3 days

Note : *Niyamana Saṁskāra* is meant for *Capalatwa nivṛtti,* which came into mercury from native and has been increased by *Rodhana Saṁskāra* as it makes mercury more active and potentiated. Thus its *Capalatwa* is also increased. According to *Rasendra Mangala* mercury becomes *Nirmala* and *Tejaswi* and also an *Agnisthayi* after *Niyamana Saṁskara.*

Dīpanā

धातुपाषाणामूलाद्यैः संयुक्तो घटमध्यगः । ग्रासार्थं त्रिदिनं स्वेदो दीपनं तन्मतं बुधैः ।। र.र.स. ८/६७

Pārada is processed by *Śwedana* (boiling) in *Kāñji* along with metals, minerals and various

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medicinal substances in *Dolāyantra* for 3 days. It is called *Dīpanā*. This enhances the power of *Pārada*, of consuming the minerals like *Abhraka* etc.

Ingredients : 1. *Niyamita mercury* One part
2. *Kalka Dravyas* $^1/_{16}$ th part each
Sphaṭikā
Tankaṇa
Marica
Saindhava lavaṇa
Rājikā
3. Liquid-*Kāñjī* as required

Method : All *Kalka dravyas* are to be pasted finely and may be kept in *Kadalipatra.* Now place the mercury in the *Kalka* and the whole thing is to be made in *Caturguṇa vastra poṭṭalī* which is to be suspended inside the *Kāñjī* liquid in *Dolāyantra* for its *Śwedana* by applying heat (Slow), for three days continuously. After the process of *Śwedana* take out the *poṭṭali* from the *Dolā yañtra* and collect mercury from the *Kalka* by washing it with hot water.

Equipment : Dolā yañtra, Khalva yañtra, Śīlāpaṭṭa, Vastra, thread etc.

Uses : To make the mercury *Grāsārthī* or *Bubhukṣita.*

Duration : 3 days.

Note : Though the *Śwedana,* process is common in three *Saṁskāras* like–*Śwedana, Niyamana,* and *Dīpana* the drugs used in all the three *Saṁskaras* are different, hence their purpose is also different. Only *Saindhava lavaṇa* is common in all the three *Saṁskāras* which may help to increases its appetite or amalgam power. The main aim of this *Saṁskāra* is to increase its appetite and thus to make the mercury *Grāsārthī.* According to *Rasaratna samuccaya* the aim of *Dipana Saṁskara* is *Virya* and *Tejo Vṛddhi* which means *Pārada* is made more active and bright. Why does it become brighter after these *Samskāras?* The clarification regarding this is seen in *Rasapaddhati* where it is clearly said that the mercury processed through these eight *Saṁskāras* become *Nirmala* and free from *Kanchuka doṣas.* It is said further that this mercury becomes highly potentiated so as to be claimed the best of all other *Rasas.* It is also said in the texts that after processing it with the above eight *Saṁskaras,* only $^1/_8$ th part of mercury remains i.e. out of 8 parts 7 parts are lost and one part remains. But now a days scholars like Prof. V.M. Dwivedi who repeated these *Saṁskaras* more then five times claim that instead of $^1/_8$ remaining only $^1/_8$ th is lost during eight *Saṁskāras.* The reason for this may be careful handling and the percentage of purity of mercury at the time of obtaining it from the market. There is a possibility that in ancient times the mercury which they used to get may not have been so pure as at present and so during processing the removal of these impurities may cause much loss in weight. The other main reason is the *Pātanayantra* of ancient time which was usually made of earthern vessels and so the chances of loss were greater with those apparatuses. But now a days we get mercury comparatively more pure as we use *Pātana yañtra* made of iron vessels. So the loss due to the removal of impurities and porosity of vessels of apparatuses is much less, Hence now a days loss during processing is not much as claimed in ancient texts.

Anuvāsana Saṁskara

Ingredients : 1. *Dipita Pārada*
2. *Jambīra Rasa*–as required

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Method : For this *Dipita Pārada* should be mixed with *Jambīra rasa* in an earthen or stone pot and should be kept in sunrays for one day or upto seven days. Then it should be washed and used.

Equipment : Earthen or stone pot

Uses : To make it as powerful as *Agni (Bahnisama Prabhāva).*

Duration : One to seven days.

Note– In the reference of *'Rasendra cintamāni'* quoted in *'Āyurveda Prakāśa'* 1000 *Nimbūphala* are advised to be used for this process and it should be rubbed with the juice of *Nimbu, Trikatu, Rajikā, Citraka, Saiṇḍhava* and *Hingu* should also be used along with *Nimbu* juice. *Mardana* should be continued for 20 days and thus mercury processed as above becomes *Bahnisamaprabhāva* i.e. it can eat and digest anything like *Vahni.*

All the *Rasa* Texts did not mention it. It has been mentioned in *'Rasa Ratnākara', 'Rasendra Cintāmaṇī, 'Ānandakanda'* and *'Āyurveda Prakāśa'*. According to some texts *'Anuvāsana'* is a type of *'Rodhana Samskāra* and according to others it is said to be a part of *Dīpana Samskāra* and hence not mentioned separately. The purpose of this *Samskāra* is also the same i.e. to make the mercury more potent and active or to increase its *Bubhukṣā* (appetite) so that it may be able to amalgamate more quantity of metals and minerals when they are mixed with it.

Various forms of mercury recommended for use

According to *'Rasendra Sāra Sangraha'* mercury may be used either after reducing it to ashes or after making it *Mūrcchita* or *Baddha.* When it is used after *Mārana* it is likely to destroy *Jara* (old age) and *Vyādhi* (disease). When it is used after making it *Mūrcchita* it cures diseases. And when it is used after *Bandhana* it induces *Khecaratwa* (sivigation power) in the body. Hence there is no other substance in the world better than mercury from its utility point of view in various forms.

The *Mārana* or *Bhasmīkaraṇa* process of mercury is very difficult. Hence it is not in common use now-a-days. The *Mūrcchanā* and its various types are comparatively easy to prepare and also least toxic, hence widely used in practice. According to texts *Mūrcchita* mercury is claimed to be highly effective in removing or curing diseases.

Concept of Mūrcchanā and Jāranā

Mūrcchanā

Mūrcchanā is a process in which mercury, with or without sulphur, is converted into a suitable compound, which could be used internally for curing diseases even without being reduced to ashes. Two main types of *Mūrcchanā* are described in the texts, viz :

1. *Sagandha Mūrcchanā*
2. *Nirgandha Mūrcchanā*

Of these *Sagandha Mūrcchana* is more widely used and has been divided in to the following sub divisions. Viz.

1. *Antardhūma*
2. *Bahirdhūma*
3. *Nirdhūma*

This *Sagandha-Mūrcchanā* is again subdivided into the following types viz:- 1. *Gandha pisti,* 2. *Gandha Baddha,* 3. *Gandha Jīrṇa,* 4. *Sagandha Kajjali* and 5. *Dhātupiṣṭi.* Of these *Dhātu piṣṭi* is

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again divided into the following five types, Viz-*Kanaka piṣṭi, Rajata piṣṭi, Śulvapiṣṭi, Abhrapiṣṭi* and *Kṛṣṇa Loha piṣṭi.*

According to *Āyurveda Prakāśa, Mūrcchanā* and *Jāraṇā* are used as synonyms. But this is true in the context of *'Gandhaka Jāraṇā'* only which is either *Iṣṭikā, Kacakūpī, Kācasampuṭa* and *Suvarṇā yañtra* type of *Antardūma* and *Bahirdhūma* type. If we consider *Jaraṇā* in its real sense then it differs from *Mūrcchanā.* This is clear from the following description of the *Jāraṇā* as found in *'Rasendracintāmaṇi'.*

Jāraṇā

ग्रासस्य चारणं गर्भे द्रावणं जारणं तथा। इति त्रिरूपा निर्दिष्टा जारणा वरवातिकैः ।।
ग्रासः पिण्डः परिणामास्तिस्त्रश्चारव्याः पराः पुनः ।। समुखा निर्मुखा चेति जारणा द्विविधा पुनः ।।

र.र.स. ८/६९-७१

The operation of *Jāraṇa* is performed in three stages viz, the *Cāraṇa* of the *Grāsa* (putting the *grāsa* in *Pārada*), *Dravaṇa* inside *Pārada* (liquifying the *grāsa* in *Pārada*) and *Jāraṇa* of *Grāsa* (*Grasa* is merged into *Pārada*).

The above three stages are also called *Grasa, Piṇḍa* and *Pariṇāma.* Putting *Grāsa* in *Pārada* is *Grāsa*, its becoming *Piṇḍa* (ball) within the *Pārada* is *Piṇḍa* and its complete merging within *Pārada* is *Pariṇāma. Jāraṇa* is again classified into two : *Nirmukha Jāraṇa* and *Samukha Jāraṇa.*

Nirmukha Jāraṇa :

निर्मुखा जारणा प्रोक्ता बीजाऽऽदानेन भागतः ।। र.र.स. ८/७२

Without making the *mukha* (opening) in *Pārada,* if *Bīja* (*grāsa*) is put, it is called *Nirmukha Jāraṇa.*

Jārānā is a process in which mercury remains in its original form and appearance even after injesting or consuming *Grāsa* of *Abhraka-Satwa, Suvarṇa* etc. metals in different proportions. In this process mercury does not require any *'Gālan'* (filtration) or *Pātana* (Distillation) processes to regain its original form and appearance. At the end of this process it not only regains its original form and appearance but its weight also remains unchanged, that is there will not be any increase in the weight of mercury after the *Jāraṇā* process is over. Thus the returning of mercury to its original form and weight is essential in the *Jāraṇā* process, whereas in the *Mūrcchanā* process it is not so. In this process mercury is changed into some compound form suitable for the therapeutic uses. Probably because of this reason it is said in the context of *Mūrcchanā* that though, it is different from a *Bhasma* still it helps in making mercury suitable for internal administration to cure the diseases. But in the case of *Jāraṇā* it is not so, as at the end of this process mercury remains in its original liquid form and thus can not be used as it is for therapeutic purposes. It is done with a view to process mercury for *Dhātuvādha/Rasavāda* (Transmutation) purposes. It is said further than in addition to *Dhātuvāda, Jāraṇā* is also done to induce *Rasāyana* property in mercury while *Mūrcchanā* is done to cure the diseases. According to the texts heat treatment in some way or other is also essential in *Jāraṇā* process while it is not so essential in *Mūrcchanā* process, as it is possible even without heat treatment. The best examples of *Niragni Mūrcchanā* are *Kajjalī, Mugdharasa* etc. preparations where *Mardana* (grinding) is sufficient to complete the *Mūrcchanā* process.

Thus it could be said that the *Mūrcchan* and the *Jāraṇā* are two different processes of mercury and are done with different purposes. Only in some context (that is in the context of *Gandhaka Jāraṇa)*

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in *Rasa Sindūra* and *Makaradhwaja* etc. preparations, may these be taken as synonyms. Otherwise there is no similarity between the *Jāraṇa* and the *Mūrcchanā*. It is said in *'Rasasāra'* that *Jāraṇā Saṁskāra* of mercury may usually result in *Pārada, Bandhana,* that is mercury may convert into a solid form after the completion of *Jāraṇa Saṁskāra.* This statement may also be considered in the context of *Gandhaka Jāranā* and thus it may also be taken as a synonym of *mūrcchanā.*

Importance of Gandhaka Jāraṇā

Gandhaka Jāraṇā is a process in which *Gandhaka* is added to mercury in different proportions and burnt with the help of the fire, that is-extra sulphur added to mercury is burnt by heating in some specially recommended *yantras* (apparatuses). It is claimed in this context that mercury is potentiated in many ways by this method and that the potentiation depends upon the proportion of sulphur added, and its burning in mercury, that is the potency or the efficacy of mercury increases in proportion to the *Gandhaka Jāraṇā.* Thus it is said in the texts that the potency or the effectiveness of *'Ṣaḍ-guṇa-Balijā rita pārada'* is much greater as compared to *'Samaguṇa* or *Dwi-guṇa-Balijārita Pārada'*. It is further said that the potency or the effectiveness of *'Sata-guṇa* and *Sahasra-guṇa Balijārita Pārada'* may be 100 and 1000 times more than the ordinary one. Not only this, it is also claimed in *''Rasendracintāmaṇi''* that without doing *'Ṣaḍ-guṇa, Balijāraṇa'* mercury does not become capable of removing or curing diseases. Thus *'Balijāraṇa'* in different proportions is considered an essential process for making mercury and its compounds highly effective for therapeutic purposes. It is also an essential prerequisite to the actual *Mūrcchanā* process as without *'Gandhaka Jāraṇa'* more *Mūrcchanā* may not make mercury compounds therapeutically so effective that they may acquire *'Avyabhicarita-Vyādhighātakatā'* (definite disease removing capacity) as mentioned in the context of the *Mūrcchanā* process.

Though mercury, after simple purification, may be used for the *Mūrcchanā* process, if after simple purification *'Gandhaka-Jāraṇa'* in different proportions is done before subjecting mercury to the *Mūrcchanā* process, its effectiveness in curing diseases may increase many times. This is clear from a reference in *'Rasendra cintāmaṇi'* in which the properties of *'Sama-guṇa, Balijāraṇa'* to *'Sad-guṇa Balijāraṇa,* have been described.

According to this description *Samaguṇa gandhaka Jārtia-Pārada* becomes 100 times more powerful than that of simply purified mercury. *Dwiguṇa gandhaka Jārita Pārada,* Develops the power of curing all types of *Kuṣṭhas. Tri-Guṇa, gandhaka-jārtia-Pārada,* removes all types of *Jāḍyatā* (stiffness). *Caturguṇa gandhakajārita Pārada* cures all types of *Vāta* and *Pitta* diseases. *Pañca-guṇa-gandhaka-jārita Pārada* cures all types of *Kṣayajarogas* and the *Ṣad-guṇa gandhaka-Jārita Pārada* acquires the power of removing all types of diseases. Thus *Gandhaka Jāraṇā* in different proportions helps mercury to become potentiated in many ways. That is what is claimed in the texts and needs proper scientific evaluation.

Apparatus & Methods for Gandhaka Jāraṇa

The texts have mentioned various types of *Yantras* (apparatuses) and methods for doing *Gandhaka Jāraṇā* in varying proportions to potentiate mercury in many ways. For this purpose nearly 20 types of *yantras* have been mentioned in *Rasapaddhati,* Out of these *Garbha yantra, Mūṣā yantra, Bhūdhara, Yantra, Gauri yantra, Bālukā yantra, Kūpī yantra, Ghaṭi yantra, Tulā yantra* and *Iṣṭikā yantra* are very common and popular and deserve mention.

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Features

1. From looking into all these methods one thing becomes clear that the whole amount of sulphur is not added at a time. It should be added slowly (little by little). In other words it may be said that if *Ṣadguṇa gandhaka-Jāraṇa* is to be done then in the first instance add *Samaguṇa gandhaka* and allow it to burn. When it is completed add some more and allow it to burn. When its *Jāraṇa* is complete again add some more and allow its *Jāraṇa* to be completed. In this way any amount of sulphur could be made *Jārita* in mercury, but it should be added little by little and allowed to become *Jīraṇa* by continuous heating.

2. The other important feature of this process is time and temperature of heating. It should not be very high or very low. It should be adjusted according to the method followed, and the *Yañtra* used. Now-a-days the *Bālukā yañtra* method is commonly used for *'Gandhaka Jāraṇā.* Where *Kācakūpī* covered several times with cloth and clay is generally used for filling the material. Here *Mṛdu* (slow), *Madhya* (moderate) and *Tivra* (high), *Agni* for six hours in each case may be needed for the *Jāraṇa* of each part of *'Gandhaka'*.

3. The third important feature is the quantity of *Gandhaka.* This, according to texts, has been recommended from equal amount to thousand times depending upon the purpose for which it is done. In addition to this, the texts have mentioned that as we go on doing *Jāraṇā* more and more the power or the potentiation of mercury may also increases in the same proportion. It is also explained in the texts, that the properties of *Pārada, Gandhaka* and *Abhraka* are almost the same. Hence in the *Jāraṇā* process though, sulphur is burnt and goes as fumes, its properties are left in the mercury and thus make it more powerful and potent. It is also mentioned in the texts that if mercury is to be made potent and powerful in destroying or curing diseases the *Gandhaka Jāraṇā* upto *Ṣad-guṇa* (six-times) is sufficient. But if it is to be potentiated and made useful for *Lohavedha* purposes the *Gandhaka Jāraṇā,* upto *Sataguṇa* and *Sahasraguṇa* may be needed. It is also said in *Rasa Ratnākara* that *śataguṇa balijārita-Pārada* acquires the power of *Sahasravedhitatwa,* that is it may transmute base metals in 1/1000th parts and *Sahasrguṇa balijārita-Pārada* may acquire the *lakṣavedhitwa* power, i.e. it may transmute, base metals even in 1/100000th parts.

Grāsamāna

इयन्मान्सय सूतस्य भोज्यद्रव्यात्मिकामितिः । इयतीत्युच्यते याऽसौ ग्रासमानं समीरितम् ।। र.र.स. ८/६८

Grāsamāna is the process of ascertaining the quantum of the *Grāsa*, taken by a certain quantity of the *Pārada.*

Characteristics of Bīja

शुद्धं स्वर्णं च रूप्यं च बीजमित्यभिधीयते ।। र.र.स. ८/७३

A pure *Swarṇa* as well as pure *Rajatha* which are put into *Pārada* are called *Bīja.*

Characteristics of Mukha

चतुःषष्ट्यंशतो बीजप्रक्षेपो मुखमुच्यते ।। एवं कृते रसो ग्रासलोलुपो मुखवान् भवेत् ।
कठिनान्यपि लोहानि क्षमो भवति भक्षितुम् ।। इयं हि समुखा प्रोक्ता जारणा मृगचारिणा ।।
र.र.स. ८/७४-७६

The Process of adding $^1/_{64}$th part of *Pārada*, the *bīja* i.e. pure *Swarṇa* or pure *Rajatha* to *Pārada* is called *Mukha.* This makes *Pārada, Grāsalolupa* (longing for *grāsa*). Such a *Pārada* is called *Mukhavān*

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(possessed of mouth), which is capable of accepting (consuming) even very hard metal. Such type of *Jāraṇa* is named as *Saṁukha Jāraṇa* by a *Rasasiddha* called *Mrigacari*.

Characteristics of Rakṣasāvaktra Pārada

दिव्यौषधिसमायोगात्स्थितः प्रकटकोष्ठिषु । भुंजिताखिललोहाद्यं योऽसौ राक्षसवक्त्रवान् ।। र.र.स. ८/७७

The *Pārada* which is processed by divine herbal drugs and kept in the open *Koṣṭhi* (furnace), in an open crucible, can consume all kinds of substances like metals etc. Such a *Pārada* is called having *Rākṣas Vaktra* (demonic mouth).

रसस्य जठरे ग्रासक्षपणं चारणा मता ।। र.र.स. ८/७८

The process of adding *Grāsa* into the (womb of) *Pārada* is called *Cāraṇa*.

Garbhadruti

ग्रस्तस्य द्रावणं गर्भे गर्भदुतिरुदाहता ।।

Liquifying the substance which is given as *Grāsa* inside (in the womb of) the *Pārada* alone, is called *Garbhadruti*.

Bāhyādruti

बहिरेव दुतं कृत्वा घनसत्त्वादिकं खलु । जारणाय रसेनद्रस्य सा बाह्यदुतिरुच्यते ।। र.र.स. ८/८०

Bāhyadruti is the process of liquifying the substances like *satva* of *Abhraka* etc. (which is to be given as *grāsa*) without (separately) *Pārada*.

Characteristics of Druti

औषधाध्मानयोगेन लोहधात्वादिकं तथा । सन्तिष्ठते द्रवाकारं सा दुतिः परिकीर्तिता ।।
निर्लेपत्वं दुतत्वं च तेजस्त्वं लघुता तथा । असंयोगश्च सूतेन पंचधा दुतिलक्षणम् ।।
र.र.स. ८/८१-८२

The metals like *Swarṇa* etc. and such other minerals remain in the form of liquid due to processing in various specific drugs and also by blowing in intensive fire. Such liquified material is called the *Druti* of the original metal. Not sticking to the vessel, remaining in the form of liquid, being lustrous, being light an readily mixing with *Pārada* are the five specific characteristics of *Druti*.

Characteristics of Jāraṇa

दुतग्रास परिणामो बिडयन्त्रादियोगतः । जारणेत्युच्यते तस्याः प्रकाराः सन्ति कोटिशः ।। र.र.स. ८/८३

When the *Grāsa* with the help of *Biḍayantra* and various instruments, become one with the *Pārada*, after readily mixing, the process is called *Jāraṇa*. There are millions of varieties in it.

Characteristics of Biḍa

क्षारैरम्लैश्च गंधाद्यैर्मूत्रैश्च पटुभिस्तथा । रसग्रासस्य जीर्णार्थं ताद्विडं पीरकीर्तितम् ।। र.र.स. ८/८४

In order to digest the *Grāsa* put into the *Pārada*, a special kind of preparation called *Biḍa* is used which is prepared by using drugs like *Kṣāras* (eg. *Yavakṣāra*), *Āmlas* (eg. *Jambīra*) *Khanijas*-minerals, Urines (eg. cows urine) etc.

Rañjana

सुसिद्धबीजधात्वादिजारणेन रसस्य हि । पीतादिरागजननं रंजन परिकीर्तितम् ।। र.र.स. ८/८५

The *Bīja* (like *Swarṇa*, *Rajata* etc.) which is processed by special operations, is subjected to

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Jāraṇa in *Pārada* and imparted with the colours such as yellow etc. This process is called *Rañjana*.

Saraṇa

सूते सतैलयन्त्रस्थे स्वर्णादिक्षेपणं हि यत् । वेधाधिक्यकरं लोहे सारणा सा प्रकीर्तिता ।। र.र.स. ८/८६

Pārada is taken in a *Yantra* filled with oil (in a crucible) and *prakṣepa* (adding) of metals like *Swarṇa* etc. is given, which is called *Saraṇa*. This enhances the potency of the *Pārada* in the process of *Vedha* (converting the lower metals into gold etc.) of various metals.

Characteristics of Vedha

व्यवायिभेषजोपेतो द्रव्ये क्षिप्तो रसः खलु । वेध इत्युच्यते तथैः स चानेकविधः स्मृतः ।। र.र.स. ८/८७

According to scholars *Vedha* is a process in which the *Pārada* processed and prepared with the help of drugs which are *Vyavāyi* (capable of assimilating very quickly) in nature, is added into the metals like iron etc. This *Vedha* is of many kinds.

Varities of Vedha

लेपः क्षेपश्च कुन्तश्च धूमाख्यः शब्दसंज्ञकः ।। र.र.स. ८/८८

There are five kinds of *Vedha* : *Lepavedha*, *Kṣepa vedha*, *Kuṇṭavedha*, *Dhūmavedha*, *Śabdavedha*.

Lepa vedha

लेपेन कुरुते लोहं स्वर्णं वा रजतं तथा । लेपवेधः स विशेषः पुटमत्र च सौकरम् ।। र.र.स. ८/८९

Lepavedha is a process of transforming the metals into *Swarṇa* and *Rajata* by smearing the processed *Pārada* on them. In order to *Smear* the *Pārada*, it is necessary to use the *Śoukara puṭa* (heat of strong sun rays).

Kṣepa vedha

प्रक्षेपणं दुते लोहे वेधः स्यान्क्षेपसंज्ञितः ।। र.र.स. ८/९०

The process of transforming the metals into *Swarṇa* etc. by adding processed *Pārada* in these liquified metals, is called *Kṣepa vedha*.

Kuṇṭa vedha

संदशधृतसूतेन दुतद्रव्याहतिश्च या । सुवर्णत्वादिकरणी कुन्तवेधः स उच्यते ।। र.र.स. ८/९१

Little amount of *Pārada* is held with the help of forceps and added into the liquified metals and brought up again, by which the metals transform into *Swarṇa* etc. This process is called *Kuṇṭavedha*.

Dhūma vedha

वन्हौ धूमायमानेऽन्तः प्रक्षिप्तरसधूमतः । स्वर्णाद्यापादनं लोहे धूमवेधः स उच्यते ।। र.र.स. ८/९२

The processed *Pārada* is heated and its vapours should be brought into contact with metals like *Loha* etc., by which, they will turn into *Swrṇa*, *Roupya* etc. This process is known as *Dhūmavedha*.

Śabda vedha

मुखस्थितरसेनाल्पलहोस्य धमनात्खलु । स्वर्णरूप्यत्वजननं शब्दवेधः स कीर्तितः ।। र.र.स. ८/९३

The metals which are liquified in the crucibles are blown by mouth keeping the processed *Pārada* in the mouth. This enables the transformation of metals into gold and silver. This process is called *Śabdavedha*.

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Udghatana

सिद्धद्रव्यस्य सूतेन कालुष्यादिनिवारणम् । प्रकाशनश्च वर्णस्य तदुद्घाटनमीरितम् ।। र.र.स. ८/९४

The pollution of any substance, which is processed and prepared by the processed *Pārada*, is eradicated and the original colour of that substance is excelled by an operation, which is known as *Udghataṇa*.

Śwedana

क्षाराम्लैरौषधैः सार्धं भाण्डं रुद्धाल्नतियत्नतः । भूमे निखन्यते यत्नात् स्वेदनं सम्प्रकीर्तितम् ।। र.र.स. ८/९५

Śwedana is the process in which the *Pārada* is kept along with *Kṣara* (alkalies) and *Āmlas* (acidic substances) in a closed vessel, which is kept burried inside the earth.

Sanyāsa

ररस्यौषधयुक्तस्य भाण्डरुद्धस्य यत्नतः। मन्दाग्नियुतचुल्ल्यन्तः क्षेपः संन्यास उच्यते ।। र.र.स. ८/९६

Pārada is mixed with medicinal substance in a vessel, the mouth of which is sealed properly. The vessel is then heated on mild fire. This process is known as *Sanyāsa*.

द्वावेतौ स्वेदसंन्यासौ रसराजस्य निश्चितम् । गुणप्रभावजनकौ शीघ्रव्याप्तिकरौ तथा ।। र.र.स. ८/९७

The processes viz, *Śwedana* and *Sanyāsa* described above, are certainly able to enhance the qualities as well as the potency of the *Pārada* and can be made to absorb throughout the body, very quickly.

Rasa Bandha

Bandha or *Bandhana* is a process of mercury which helps to convert liquid mercury into solid state with the help of various materials. It is done with a view to restricting its *cāñcalya* (quick moving property) and *Durgrahatva* (difficulty in catching) properties. According to form, process and the type of drugs used, the *'Bandhas'* may be divided into the following types :

1. *Jalūka bandha*–also known as *Pakva bandha*
2. *Khoṭa bandha*–also known as *Piṣṭkā bandha*
3. *Poṭa bandha*–also known as *Parapaṭikā bandha*
4. *Bhasma bandha*–also known as *Bhūtisama* (ash-like)

These are considered as *Uttama* (best), *Madhyama* (good), *Adhama* (inferior) and *Adhamādhama* (very inferior) respectively. A fifth type *'Druti bandha'* is also found described in some texts *(Rasa Prakāśa Sudhākara)*, and is done by using different types of *druties*, specially *'Abhraka druti'*. It is claimed to posses *Dehalohakara* property. On the basis of the drugs used for *bandhana, Rasa bandhas* are of the following types :

Name of groups , Name of texts, Number of drugs and their uses

No.	Name of the group	Name of the texts	No. of durgs	Uses/Process
1	*Rasa Mūlikā*	*R.R.S.*	53	*Swedana, Bhāvanā, Mūṣā lepa*
2	*Rasa Niyāmikā*	*Rasārṇava*	45	*Mārana, Jāraṇa, Bandhana*
3	*Rasa Nirjīvakarā*	-do-	50	*Rasa Cāñcalya Nivṛtti*
4	*Rasa Bandhakarā*	-do-	33	*Rasabandhana*
5	*Rasa Drāvikā*	-do-	09	*Rasa/Loha drāvaṇa*

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6	*Rasa Krāmikā*	-do-	20	*Rasa Krāmaṇa*
7	*Rasāyanauṣadhies*	-do-	03	*Rasāyanakara*
8	*Rasauṣadhies*	*R. Cu.*	68	*Bandhana, Māraṇa, Jāraṇa, Niyamana*
9	*Aṣṭamūlikās*	*Rasārṇava*	08	*Rasa Śodhana, Māraṇa*
10	*Divyauṣadhies*	*Rasendra Cu.*	64	*Rasabandhana, Jarā*
		R.P.S.	64	*Nāśana*
		Rasa Ratnākara	132	
11	*Mahauṣadhies*	*R.P.S.*	68	*Bandhana, Māraṇa*
12	*Siddhauṣadhies*	*R.P.S.*	68	*Deha/Loha*
13	*Rasa Mārakauṣadhies*	*Rasārṇava*	24	*Rasa Māraṇa*
14	*Sarpākṣyādigaṇa*	*Ras. Cu.*	46	*Rasa Niyamana*
15	*Vyāghrikādigaṇa*	-do-	85	*Rasa Māraṇa*
16	*Rakta Snuhyādigaṇa*	*Ras. Cu.*	40	*Śodhana, Māraṇa, Bandhana*
17	*Kadalyādigaṇa*	-do-	08	*Rasa/Loha Drāvaṇa*
18	*Pañcaratnagaṇa*	-do-	05	*Bandhana, Māraṇa, Deha/Loha Siddhi*
19	*Kākamācyādigaṇa*	-do-	18	*Krāmaṇa*
20	*Vajra daṇḍādigaṇa*	-do-	13	*Rasāyana, Jarāvyādhi*
21	*Bhūpatyādi Varga*	-do-	08	*Rasa bandhana*

1. *Mūlikābandha*–which is done through various types of herbs.
2. *Maṇibandha*–which is done through various precious stones.
3. *Dhātubandha*–which is done through various metals.
4. *Drutibandha*–which is done through various *druties*.

It is important to mention here that though the *bandha* performed through various types of herbs changes to solid state, in its real sense it is not *bandhana,* as that may not resist heat treatment. Further, it is clearly mentioned in *'Rasārṇava'* that the extractives of ordinary herbs do not possess the power of doing *Rasa bandha.* Only the *divyauṣadhies* are capable of doing *Rasa bandha,* as the other *Vanyauṣadhies* are not capable of doing *Rasa bandha*. It is mentioned in the texts that if *Vanyauṣadhies* and *Tṛṇauṣadhies* make *Rasa bandhana,* then that is not *Agnisthāyī;* they neither convert into *khoṭa* or *bhasma* form, nor prove useful for *Dravyakarma* (metallic transformation) purposes.

In *Rasārṇava,* the *Rasa bandhas* are described on the basis of form, viz. *Mūrcchita, Mṛta, Jalūkā, Mūrti, Paṭṭa, Bhasma* and *Khoṭa.* It has further added *Piṇḍikā, Druti* and *Cūrṇa bandhas* also in this list. In the 13th Chapter of *'Rasārṇava'* the following three types of *bandhas* have been described on the basis of *Sādhanas* (causative factors): *Mūlabandha, Rasabandha* and *Pākabandha.* It further mentions that *Mūla bandha* is best, *Rasa bandha* is better and *Pāka bandha* is inferior.

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Suitability of Mercury for Bandhana

It is mentioned in '*Rasendra Cūḍāmaṇi* that *Abhrajīrṇatā, Gandhakajīrṇatā, Packṣacchinnatā* and *Sabījakatā* of mercury are considered essential for its *bandhana* and herbs can do the *bandhana* of such mercury only.

Form and Appearance of Baddha Pārada

Baddha Pārada is a hard as *Vajra* (diamond). It should be white and shining like a moon.

Properties and Effects of Baddha Pārada

According to '*Rasa Prakāśa Sudhākara*', *baddha* (solidified) mercury becomes highly potentiated both from *Loha vedha* and *Dehavedha* points of view. If kept in mouth, it produces *Vīryastamabha* (arrests early discharge of semen or prolongs the semen retention power), gives all types of *Siddhies,* prevents *Jarā* (ageing process), makes the body strong like *Vajra,* removes *Vali* and *Palita,* cures all the diseases, acquires *Mukha* (better metal consuming/amalgamation power), *Vedha* power. *Vanga Stambhana* power, milk solidifying power and removes *Dāridrya* (poverty) also.

Types of Bandhās

Rasaratnasamuccaya has given a detailed description of the types of *bandhās* and their definitions & uses. Initially 25 types of *bandhās* are mentioned in this text and then according to some scholars a 26th *Jaūlkā bandhā* was also added to this list.

Description of each type

1. *Haṭha Bandhā :* When mercury is converted to the solid state without being subjected to *Suddhi* (purification) that is known as *Haṭha bandhā.* It is not recommended for internal use as it is likely to cuase severe disease and even death.

2. *Āroṭa Bandhā :* When mercury is made solid after proper purification then that is known as *Āroṭa Bandhā.* It is considered the best for *Kṣetrīkaraṇa* process and if used internally it may slowly remove all diseases.

3. *Ābhāsa Bandhā :* When mercury, mixed with metals and triturated with vegetable extractives, attains a solid state and leaves its original properties. That is known as *Ābhāsa Bandhā.* According to texts. *Ābhāsa* means *Guṇavaikṛti* (i.e. change in original *guṇas* properties).

4. *Kriyāhīna Bandhā :* When purified mercury is mixed with unpurified metals/minerals and made into a solid state then that is known as *Kriyāhīna bandhā.* It proves harmful to the body only when *Apathyas* are used during its course.

5. *Piṣṭikā Bandhā :* When mercury is made into *Piṣṭi* form like butter by continuous grinding/rubbing in strong sun heat that is known as *Piṣṭi bandhā.* As per the text small quantity of sulphur should be mixed with mercury for this process. It improves *Jaṭharāgni* and digestive power.

6. *Kṣāra Bandhā :* When *Śankha/Śukti/Varāṭa bhasma* is mixed with mercury to make it solid then that is known as *Kṣāra Bandhā.* Its is internal use improves *Jaṭharāgni,* produces *Puṣṭi* (tone) in the body and cures *Jaṭharavyathā* (Abdominal pain). As in this type *bandhana* is done through *Kṣāra padārthas,* the same is known as *Kṣāra Bandhā.*

7. *Khoṭa Bandhā :* When mercury is converted into a solid, round and ball like thing which on continuous heating shows slow loss then that is known as *Khoṭa Bandhā.* When used internally this cures all diseases quickly. According to some scholars *Khoṭa Bandhā* must stand to heating (i.e. it

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must be completely thermostable).

8. *Poṭa Bandhā :* When *Kajjalī* after getting melted is made into *parpaṭi* form by pressing it in banana leaf then that is known as *Poṭabandha.* This is used to cure all types of diseases specially of children.

9. *Kalka-Bandhā :* When mercury attains the consistency & appearance of mud after passing through *Swedanādi* processes then that is known as *Kalka Bandhā.* It exhibits the effects of the preparations with which it is used.

10. *Kajjali Bandhā :* When mercury and sulphur are mixed together and rubbed till a smooth black coloured powder known as *Kajjali* is made then that is known as *Kajjalī bandhā.* The preparations in which *Kajjali* is mixed are also named *Kajjali bandha.*

11. *Sajīva Bandhā :* When loss of mercury is obvious even after *bhasmīskaraṇa* through heating then that is known as *Sajīva bandhā* (that means it does not become completely *Mṛta;* hence this when administered internally may not be able to perform the normal functions of *pārada bhasma* i.e. it is not capable of removing *Jarā* (old age) and *Vyādhis* (diseases).

12. *Nirjiva Bandhā :* When mercury is converted into *bhasma* form after doing *Abhraka* and *Gandhaka jāraṇa* then that is known a *Nirjīva bandhā.* This when used internally may cure diseases immediately.

13. *Nirbīja Bandhā :* For this 1/4th *suvarṇajāraṇa* is made first then that mercury is used for making *Piṣṭi* with sulphur. This *Piṣṭi* after being subjected to *Puṭapāka* with an equal amount of sulphur is known as *Nirbīja bañdha.* It can cure all diseases when used internally.

14. *Sabīja Bandhā :* For this, prepare, a *piṣṭi* first, adding *Abhraka satwa, Hema* (gold), *Tāra* (silver), *Arka* (copper) and *Kāñtaloha* to mercury and then reduce it into ashes adding six times as much sulphur. This is known as *Sabīja bandhā.* It is claimed to be highly effective for all purposes.

15. *Śṛmkhalā Bandhā :* When *Pārada bhasma* prepared through *Vajrādi ratnas* and other drugs are mixed together in equal parts that is known as *Śṛmkhalā bandhā.* This is claimed to be useful for *Deha* as well as *Lohakarmas.* Mercury in this form may be absorbed quickly and thus produce immediate effects on the body.

16. *Druti-Bandhā :* When mercury is converted either into solid form or into *Bhasma* form by using *Druties* prepared outside then that is known as *Drutibandhā.* This is said to cure all severe diseases when used internally in a dose of $^1/_4$th *Rājikā* ($^1/_2$ mg).

17. *Bālaka Bandhā :* When *Pārada jārita* with an equal part of *Abhraka* is converted into *Bhasmā* form then that is known as *Bālaka bandhā.* This is claimed to be *Rāsāyana* and when administered internally it prevents or cures all diseases along with their complications. It acts as curative, preventive and health promoter also.

18. *Kumāra Bandhā :* When *bashma* is made from *Dwiguṇābhra jārita pārada* (mercury with double the amount of *abhraka)* then that is known as *kumāra bandhā.* This is claimed to remove all types of *pāpaja rogas* and acts as *Rasāyana* also when used in on *Tanḍula* dose for three weeks.

19. *Taruṇa Bandhā :* When *bhasmā* is made from *Caturguṇābhrajārita pārada* (mercury with four parts of *Abhraka)* then that is known as *Taruṇa-Bandhā.* This is claimed to be the best *Rasāyana.* It can cure all diseases within a week and promote *bala* and *vīrya* of a person.

20. *Viddha Bandhā :* When *bhasmā* is made from *Ṣadguṇābhrajārita pārada* (mercury with six parts of *Abhraka*) and when it has acquired friendship with *Agni* (fire) (i.e. becomes thermostable)

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then that is known as *Vṛddha bandhā*. It is highly useful for *Dehakarma* and *Lohakarma*.

21. *Mūrti Bandhā :* When mercury is made solid and thermostable only with *Divyauṣadhies* without subjecting it to *Abhrakajāraṇa* then that is known as *Mūrti Bandhā*. It does not show any loss even after continuous heating on fire. When used internally along with other preparations it exhibits wonderful and uncomparable effects in the body.

22. *Jala Bandhā :* When mercury is made solid by the effect of *Śilātoya* (a specific kind of water) or other type of water then that is known as *Jala Bandhā*. It can cure diseases and prevent *Jara & Mṛtyu*. When it is mixed with other preparations, they are potentiated further.

23. *Agni Bandhā :* When mercury, alone or mixed with other drugs, is converted into *Guṭikā* form after heat treatment and does not show any loss on further heating then that is known as *Agnibandhā*. It is claimed as *Khecaratwakṛt* (i.e. to make the man capable of moving in the sky).

24. *Susamskṛta Bandha :* Collect *Viṣṇukrāntā, Somalatā, Jalakumbhī, Dhattūra Mūla, Viṣālā, Indra Vāruṇī, Nāgini, Kanda, Vyāghrapādi, Kurantaka, Sahacara, Vṛścikāli, Hastiśuṇḍī, Hamsapādi, Sahā (Mudgaparaṇi)* and *Āsuri* each in $^1/_6$ th part of mercury and mix them with the urine of a virgin cow and make a paste. Mix *Pārada* with this paste and prepare a *golaka* after proper grinding and heat the whole in *Bālukā yañtra*. Now this may be mixed with the *bhasmas* of other drugs (*lohas*) and may be heated to achieve its *Mūrcchā* or *Bandhana*. This is known as *Susamskṛta bandha*.

25. *Mahā Bandhā :* For this mercury is mixed either with gold or with silver and heated. Through this process a homogenous amalgam is made and mercury is converted into a solid, heavy, white and long *Guṭikā* which does not show any loss on heating. When pressed or hammered it becomes powder like *lavaṇa* (salt) and does not produce any *mala* (Blackish colour) or rubbing it melts quickly without producing any smell. This is known as *Mahā bandhā*.

26. *Jalūkā Bandhā :* The *Jalūkā Bandhā* described in *Rasa Ratna Samucchaya* is the 26th type *bandhā* according to some scholars. It is not useful for therapeutic purposes and said to be useful for sexual purposes.

For this $^1/_2$ nd part of gold or $^1/_4$ th part of lead is added to mercury and then $^1/_{16}$ th part of each of the following drugs are to be added and ground well *Taptakhalva*. By this process mercury may be converted into *Jalūkā* shape. The drugs are *Eraṇḍabīja, Śalmalibija, Bhauga bīja, Śleṣmātaka bīja, Jyotiṣmatī, Kolaphala, Tila* and *Tejapatra*.

Rasa Gati

Mercury is wasted due to various causes during mercurial operations. After the completion of the process of *Aṣṭa Samskāras*. The reason for the wastage of mercury is due to the following different types of mercurial movements (*Rasa gati*) :

1. *Jala gati*, 2. *Haṁsa gati*, 3. *Mala gati*, 4. *Dhūma gati*, 5. *Jīva gati*.

Jala Gati

Wastage of mercury while washing it with water is known as *Jala gati*.

Haṁsa Gati

While transforming the mercury during the process of pounding from one container to other or some of the minute particles of mercury jumping like *swān*, result in some wastage of mercury. This is called *Hamsa Gati*.

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Mala Gati

Wastage of mercury during mercurial operations alongwith *pārada doṣas* is called *Mala gati*.

Dhūma Gati

During the process of mercurial operations, while keeping the mercury on fire, some part of mercury is wasted in the form of vapor. It is called *dhūmagati*.

Jīva Gati

Wastage of mercury without our notice similar to that of *ātma* that expels from the body is called *Jīva gati*. Among all the *gatis*, the first four movements of mercury are visible where as the fifth one i.e. *Jīva gati* is invisible. To reduce the percentage of wastage of mercury one should be cautious while performing mercurial operations by adopting the following ways and means. Pounding the mercury with the herbs which are useful in *mardana samskāra* controls *jala gati*, *hamsa gati* and *mala gati*. Processing mercury with *niyāmaka gaṇa dravya* controls *dhūma gaṭi*. *Jīva gaṭi* can be controlled as by means of *mantra, dhyāna* etc.

Rasabhasma

Most of the practitioners are using are *rasasindūra*, *rasakarpūra*, *mugdha rasa* etc. in their practice. Whereas *rasabhasma* is rarely used. The author of *Rasaratnasamuchchaya* mentioned 8 *varieties* of *māraṇa* procedures for the preparation of *rasabhasma*.

द्विपलं शुद्धसूतस्य सूतार्द्धं गन्धकं तथा । कन्यानीरेण संमर्द्य दिनमेकं निरन्तरम् ।
रुद्ध्वा तद्भूधरे यन्त्रे दिनैकं मारयेत् पुटे ।। (र.सा.सं ५८)

2 *Pala* of purified *Pārada* and one *Pala* (about 44 gms) of purified *Gandhaka* are ground to prepare *Kajjalī* which is triturated in *Kumāri* juice for a day. Then a disc *(Cakrikā)* is prepared and placed it in *Bhūdhara yantra* and heated. Thus *Pārada māraṇa* can be carried out. Infact rarely the *Bhasma* is used for internal administration. In *Rasendra Sāra Saṁgraha*, *Bhasma* of *Pārada* has been classified in to four types according to colour–*Śweta, Pīta, Rakta* and *Kṛṣṇa*. Is this means, whatever the method of *Māraṇa* is followed, the *Bhasma* which is available can be included in this classification? Can the preparations like *Rasasindūra, Rasakarpūra* and *Sarvāṅga Sundar Rasa* can be called *Bhasmās* at all? Even in *Rasendra Sāra Saṅgraha,* only, *Kṛṣṇa bhasma* has been mentioned during the description of a certain method of *Māraṇa* (Verse No. 82 to 84). Nowhere else specific coloured *Bhasma* is mentioned. In *Rasaratna Samuccaya* also, different methods of *Māraṇa* of *Pārada* have been mentioned, in which no specific colour of the *Bhasma* is indicated. It is opined that the *Māraṇa* of the *Pārada* is done effectively only if the drugs of *'Māraka gaṇa'* are used, Some other methods of *Māraṇa* follow :

भुजङ्गवल्लीनीरेण मर्दयेत् पारदं दृढम् । कर्कटीकन्दुकमूषायां सम्पुटस्थं पुटेद्गजे ।
भस्म तद् योगवाही स्यात् सर्वकर्म्मसु योजयेत् ।। (र.सा.सं ५९)

Pārada (purified) is triturated with the juice of *Nāgavalli*. It is then placed in the midst of tuber of *Karkaṭī* and covered with the mud to prepare the *Sampuṭa*. It is heated in *Gajapuṭa*. The *Bhasma* thus available is *Yogavāhī* and can be used in all the operations. The *Bhasma* which is prepared thus said to be *Yogavāhī*. Such a *Yogavahi* drug acts in harmony with other drugs when mixed and administered. Infact, without loosing its own properties, it can enhance the pharmacological action of the other drugs.

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In *Aṣṭāṅga Saṅgraha* it is stated that,

सर्वकर्मविरोधेन स्वामी कार्यं करोति भृत्यवत् । (अ.हृ.सू.५)

Such a *Yogavāhī* property of *Pārada* made it possible to use it universally in almost all *Rasayogās.*

श्वेताङ्कोठजटानीरैर्मर्द्यः सूतो दिनत्रयम् । पुटेत्तुचान्धमूषायां सूतो भस्मत्वमाप्नुयात् ।। (र.सा.सं ६०)

The purified *Pārada* is triturated with the juice of *Aṅkola* for 3 days and subjected to *Puṭa* in *Andhamūṣā* to obtain the *Bhasma.*

Here *Pārada* is triturated without *Gandhaka.* As seen in *Rasaratna Samuccaya,* similar procedure is used by triturating with *Aṅkola Mūla Rasa.* But there *Gandhaka* is added.

Andhamūṣā is a kind of crucible which is somewhat elongated and sealed after keeping the material in it. Its is said that it resembles the *Gostani mūṣā.*

Pathya during Pārada Sevana

After having bath one must perform spiritual rites to *Lord Śīva*, both in the morning and evening hours. Recite *Mṛtyuṅjaya Mahāmantra*. Wear new cloths and apply perfumed medicated pastes over the body. Salute immortals, God of fire, preceptors and *Brāhmins*. Be calm and enjoy music and dance. Always speak truth and follow *Dharmaśāstras*. Soft and comfortable bed, spending with love and affectionate woman are wholesome deeds. *Pañcāmṛta* are to be taken with food *Yava*, *godhūma, śali* rice, *drakṣa*, tender coconut water, *paṭola*, *vastūka*, *pañcamūla*, *punarṇava*, *meghanada*, *śuṇṭhi* and other drugs *anūpa māṁsa*, food processed with *ghṛta*, *jīraka*, *dhanyaka*, *haridra*, *saindhava lavaṇa* and *ardraka*, *ikśūrasa*, *hamsodaka* etc. are the wholesome food during the consumption of processed *Pārada.*

Apathya during Pārada Sevana

Everything in excess namely – alcohol, food, sleep, *jāgaraṇa* (sleepless nights) coitus, travel, anger, excitement, *lobha*, *ichcha*, hostile discussion, swimming and thinking etc. are unwholesome. Should not do sinful acts. Should not associate with animals. Avoid the shadow of *Śīvalinga* and women. Avoid urination and defecation in the public places. Should not utter harsh words. Avoid untimely meals and daytime sleep. Avoid *Kakarāṣṭaka* in the food – *kuṣmaṇḍa*, *karkaṭi*, *kalinga*, *kūsumbha*, *karkoṭa*, *karavella*, *kapali* and *kākamachi*. Also avoid *kulattha*, *atasi taila*, *tila*, *māṣa*, *masūra*, flesh of pigeon, food combined with *kañji* and *takra*, *kaṭu*, *āmla*, *tikṣṇa*, *lavaṇa*, *pichila*, *pittakara* substances, *karanja*, āmla, *sauvarcha lavaṇa*, *kānchanāra* and *śigru*.

Pārada Kṣetrikaraṇa

Kṣetrikaraṇa is the procedure of preparing the body, suitable for the consumption of mercury by means of emesis, purgation and other purificatory measures; similar to that of ploughing and watering of a field prior to sowing the seeds.

Complications due to Impure Mercury

Mūrcha, *śoka*, *bhrama*, *cardi*, *moha*, *jwara*, *hikka*, *kampa*, *śūla*, *nidra*, *alasaka*, *aruci*, *linga-stambha*, *atisāra*, *kāsa*, *sroto- mukha- netra- kukṣi- vṛṣṇa- udara- siras* and *medhra dāha* are considered as some of the major complications.

Complications of Improperly Processed Mercury

Nāsa bhaṅga, *pīnasa*, *danta- pāta*, *netra roga*, *visarpa*, *koṭa*, *kaṇḍu*, *śirahśūla*, *twak vivarnata*, *nāsikadi kṣata*, *vṛṣaṇa śotha*, *pakṣāghāta*, *hastapāda- dāha*, *unmāda*, *citta- vikṛti*, *bhagandara*, *kuṣṭa*,

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upadamsa and other complicated diseases. Apart from this there may be following adverse reactions like viz. Pain and inflammation of the gums, looseness of teeth, bleeding gums, space in between the teeth, coating on the teeth, salivation, inflammation of the tongue, uvulitis, emaciation of the body, loss of mental stability, fever, unable to perform the normal functions of the body, as well as sense organs, tooth fall, oral abscess, hemorrhage, anemia and even death.

Complications due to Mercurial Vapors

Labor working in the pharmaceutical industries and the manufacturing factories of mercurial preparations are susceptible to get the following complications due to the constant inhalation of mercury vapors. *Kampavāta* (Chorea). Emaciation of muscles (Muscular atrophy). Intestinal inflammation. Bleeding from the rectum. Vomiting, fainting and death.

Management of the Complications

Sarjakṣāra, kāravella swarasa and *gomūtra, saindhava lavaṇa* are to be taken with sour gruel. *Kāravella swarasa, kadalikanda swarasa, rāja koṣataki rasa*, and *saindhava lavaṇa* are to be taken with *gomūtra* (black cow's urine).

Treatment for Rasājirṇa

1. Purified sulphur 1/2 tola to be taken with *Goghṛta*, and then cow's milk mixed with sugar is to be given for a period of 7 days for the management of mercurial complications.
2. Administration of *kakarāṣṭaka* relieves indigestion due mercurial ingestion.
3. Steep 1 tola of *sarjakṣāra* in *karavella swarasa* and administer with *soūvarcha lavaṇa*.
4. *Sarapūṇkha, devadāli, paṭolā bija, kākamāci,* fresh juice or decoction of any one of the above drugs is to be given for 7 days.
5. Add *śuṇṭhi* or *saindhava lavaṇa* to the mixture of *sauvarchala lavaṇa* and *gomūtra*. This is to be given for a period of 3 days along with *matūlunga* (or) *jambīra swarasa*.
6. Purified sulphur 6 *ratti* with *ghṛta* (or) *triphala kwāth* (or) *śārivādya avalehya* relieves *rasajīrṇa*.

Mercurial preparations

As described earlier mercury for therapeutic purpose is used frequently in the form of *mūrcchanā* (compounds). The compounds of mercury for therapeutic uses are mainly of two types, viz–

1. Compounds with Sulphur
2. Compounds without Sulphur

In therapeutics mercury compounds with sulphur are more common and planty in number while the without sulphur mercury compounds are very few in number and their use in the therapeutics is also much limited.

The important mercury compounds with Sulphur may be divided as follows :

1. *Kajjali* group of compounds
2. *Parpaṭī* group of compounds
3. *Sindūra* group of compounds
4. *Khalvīya rasa* group of compounds

The *Kajjali* group of mercury compounds are prepared by grinding mercury and Sulphur in a mortar in different proportions without adding any kind of liquids.

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The *parpaṭī* group of compounds are prepared from the *Kajjali* alone or mixed with other drugs by heating the same till melting. There after *parpaṭī* is prepared by pressing the melted material between the banana leaves and cow dung placed up and down of the leaves.

The *Sindūra* grouop of preparations are also prepared from the *Kajjali* alone or mixed with gold, arsenic and other drugs after subjecting it to *bhāvanā* process with a few vegetable extractives. There after *Kajjalī* is subjected to mild, moderate and strong heating in a glass bottle through *Vālukā yañtra.*

The *Khalviya rasa* group of compounds are prepared through *Khalva yañtra* by grinding these with some other drugs and a few vegetable extractives.

Kajjalī

धातुर्भिर्गंधकादैश्च निर्द्रवैर्मर्दितो रसः । सुश्लक्षणः कज्जलाभाऽसौ कज्जलीत्यभिधीयते ।। र.र.स. ८/५

निर्द्रवैर्धातुभिश्चार्थ गन्धादिभिः पेषितः पारदः श्लक्ष्णतां प्रापितः ।

कज्जलाभो यदा जायतेऽसौ तदा नामतः कोविदैः कज्जलीत्युच्यते ।।

कज्जली कज्जलश्चैव मता कज्जलिका च सा । रससम्पादनादौ च विशेषात् सा विधीयते ।। र.त. २/२७-२८

The *Pārada* is ground well with, either metals like *Swaraṇa* etc. or with *Gandhaka* etc. without adding any liquid. The resultant materials, which is very soft and fine, looking like *Kajjala* (a black soft substance which is put in the eyes-collerium), is called *Kajjali.*

Without adding sulphur *kajjali* cannot be prepared. *Kajjali, Kajjala, Kajjalika* are the synonyms for *Kajjali*. Sulphur is added to mercury either in equal quantity and can also be added as half, *dwiguṇa, triguṇa, chaturguṇa, ṣaḍguṇa, aṣṭaguṇa and ṣoḍasaguṇa*. (i.e. $^1/_2$, 1, 2, 3, 4, 6, 8 and 16 parts).

Ingredients

i. *Śuddha Pārada* In equal proportion

ii. *Śuddha gandhaka* or as prescribed

Apparatus : Khalva Yañtra

Method : Mix *Pārada* and *Gandhaka* as prescribed in an iron or stone mortar and ground it carefully without adding any liquid till the mixture turns into fine, smooth & black powder without the presence of any lustre shining.

Test : 1. The final product may be tested for the presence of any lustre/shining by rubbing the product on the palm with a finger preferably after adding water. If the free mercury particles are present in the mixture, these are likely to shine in the sunrays when rubbed with water. In good preparation there should not be any such shining.

2. It should be as black as collyrium or Smoke.

Dose : 125 to 250 mg. or as recommonded.

Therapeutic Uses

Kajjalī as such is used rarely. It is used mixed with other drugs and preparations, hence its properties are similar to those with which it is used. In general it is claimed to cure all diseases, it is claimed as best *Vṛṣya* (produces strength & Vigour in the body) and effective on all the three *doṣas*.

Parpaṭī

Cākrapāṇi is the first person who has formulated *Rasa parpaṭī* among the *Āyurvedic* formulations (in *grahaṇi roga*). The name is derived from the method by which flakes of the compound are obtained.

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Method : Kajjali is prepared first with purified mercury (*pārada*) and sulphur (*gandhaka*). Other drugs mentioned in the formula are added one by one and mixed well by *triturating* in a *khalva*. The powder is put in an iron vessel and kept over fire in the *Sikata yantra*. A shallow pit in fresh cow dung is made and a *kadali leaf* or an *eraṇḍa leaf* is spread over the pit. When the medicine melts and becomes liquid, it is poured on the leaf carefully. Another leaf is covered over it and fresh cow dung is spread and gently pressed. After that, it is allowed to cool the flakes of the medicine are removed and powdered.

Preservation : They preserve their potency indefinitely and are kept in glass bottles.

Apathya : One should not drink river water or well water immediately for quenching the thirst during *Parpaṭī-kalpanā* therapy. Patient is adviced to drink plenty of buttermilk.

Pathya : Kākamāci, paṭola, ārdraka, vāstu, kadali puṣpa, nava vārtaka, purāṇa dhānya, godugdha.

Bola Parpaṭī

सूतगन्धकसुकज्जलिकायाः पर्पटी समयुता समभागम् ।
बोलचूर्णविहितं प्रतिवाप्यं स्याद्रसोऽयमसृगामयहारी ।। (योगरत्नाकर, प्रदररोग चिकित्सा; प. ८४२)

Ingredients

1. *Pārada* (purified) - 1 part
2. *Gandhaka* (purified) - 1 part
3. *Bola (Hirābola)* - 1 part

Method : Prepare of *Kajjalī* of *Pārada* and *Gandhaka* first, then add *Bola Cūrṇa* to it and mix all well and prepare a *parpaṭī* as per the method mentioned.

Dose : 1 *Ratti* to 6 *Ratti*

Anupāna : *Sugar, Madhu*

Therapeutic uses

Raktātisāra, Raktapitta, Raktapradara and *Raktārśa.*

Loha Parpaṭī

समौ गन्धरसौ कृत्वा कज्जलीकृत्य यत्नतः । शुद्धलौहस्य चूर्णन्तु रसतुल्यं प्रदापयेत् ।।
एकीकृत्य ततो यत्नाल्लौहपात्रे प्रमर्दितम् । घृतप्रलिप्तद्रर्व्यान्तु स्वेदयेन्मृदुनाऽग्निना ।।
द्रवीभूतं समाहृत्य ढालयेत् कदलीदले । चूर्णीकृत्य सुखार्थाय पथ्यभुग्भिः प्रसेव्यते ।।
शीतोदकानुपानं वा क्वाथो वा धान्यजीरयोः । लोहने पर्पटी ह्येष भक्ष्या लोकस्य सिद्धिदा ।।
रक्तिकैकां समारभ्य वर्द्धयेद्रक्तिकां क्रमात् । सप्ताहं वा द्वयं वाऽपि यावदारोग्यदर्शनम् ।।
सूतिकाञ्च ज्वरांश्चैव ग्रहणीमतिदुस्तराम् । आमशूलातिसारांश्च पाण्डुरोगं सकामलम् ।।
प्लीहानमग्निमान्द्यञ्च भस्मकञ्च तथैव च । आमवातमुदावर्तं कुष्ठान्यष्टादशैव तु ।।
हन्त्यनेन प्रयगेन वपुष्मान् निर्मलः सुखी । जीवेद्वर्षशतं पूर्णं वलीपलितवर्जितः ।।
भोजनं तक्रशालीनां त्यक्त्वा शाकं विदाहि च । आतपं वातकोपञ्च चिन्तनं मैथुनं तथा ।।

(भैषज्यरत्नावली ग्रहणी)

Ingredients

1. *Śuddha Pārada* : 1 part

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2. *Śuddha Gandhaka* : 1 part
3. *Śuddha Loha Cūrṇa* : 1 part
(*Loha bhasama*)

Method : Prepare a *Kajjalī* of mercury and sulphur take in equal parts. Then add *Loha bhasma* to it and ground well in an iron mortar. Now prepare a *parpaṭī* as per the method mentioned and use it after powdering.

Dose : Starting from 1 *Guñjā* and increasing to 10 *Guñjās* daily. The course may be continued for one or two weeks or till the patient is cured.

This *parpaṭī* may be taken daily in the morning.

Anupāna : Cold water, *Dhānya kwātha,* or *Jīraka kwātha,* Honey or as prescribed.

Therapeutic Uses

Jwara, pāṇḍu, kamala, agnimāndhya, āmadoṣaja śūla, bhasmakaroga, āmavāta, udāvarta, kuṣṭa, ajirṇa and *plīha roga, viṣa, sutika jwara, grahṇi* and *atisāra.*

Pathya : Rakta Śāli.

Apathya : Sāka & Vidāhi foods. The foods provocative of *Āmavāta.* Deep thinking and Maithuna (Coitus) should also be avoided.

Pañcāmṛta Parpaṭi

अष्टौ गन्धकतोलका रसदलं लौहं तदर्द्धं शुभम्। लेहार्द्धन्च वराभ्रकं सुविमलं ताम्रं तदऽभ्रार्द्धकम्।
पात्रे लोहमये च मर्दनविधौ चूर्णीकृतन्चैकतः। काष्यां वादरवाहि मतातिमृदुना पाकं विदित्वा दने।
रन्धयां लघु डालयेत् पटुरिवं पन्चामृता पर्पटी। ज्याता क्षोद्रघृतामिता प्रतिदिनं गुज्जद्वयम वृद्धितः।।
लोहे मर्दनयोगतः सुविमलं भक्ष्याक्रिया लोहवत्। कुज्जाष्टावधवात्रिकं त्रिगुणितं सप्ताहमेवं भजेत्।।
(भै. रा. ग्रहणीरोगाधिकार ४६१-४६४)

Ingradients

1. *Śuddha Gandhak* - *5200gm*
2. *Śuddha Pārada* - *2600gm*
3. *Lauha Bhasma* - *1300gm*
4. *Tāmra Bhasma* - *650gm*
5. *Abhraka Bhasma* - *325gm*

Method : Prepare *kajjali* at first and then add the rest of the drugs and pound well. Then prepare *parpaṭi* according to the general procedure.

Dose : 125 to 250mg. This may be increased gradually up to 750mg.

Anupāna : *Madhu, Ghṛt, Bhrsta Jīraka Cūrṇa.*

Therapeutic Uses

Grahaṇi, Atisara and *Raktaja grahaṇi*: Add *dadimaṣtaka cūrṇa* to *pancamṛta parapati* and administer along with *kuṭajarṣṭa* in *grahaṇi, atisara* and *raktaja grahaṇi, Pancamṛta parpati* mixed with *Śītopāladi cūrṇa* and is taken with honey to relieve *āmlapitta* and *ajīrṇa. Ācārya Yadavji Tṛkamji* prepared *satptamṛta parpaṭi* by adding *vaṅga* and *yaśada bhasmas* to the above five ingredients. He clamied in *siddhayogasangraha* that *saptamṛta parpaṭi* alone or mixed with *suvarṇa parpaṭi* is a

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excellent remedy for intestinal tuberculosis.

Rasa Parpaṭi

ग्रहणीगजमर्दनक्षतरा क्षयकासजलोदरगुल्महरा। अतिसारमतिभ्रमदाहहरा ज्वरशोथहरा रसपर्पटिका।।
अर्शोरोगं हरति सुतरां कामलां शुलकोपं पाण्डुव्याधिं श्वयथ्रुसहितं भस्मकञ्चातिभीष्मम्।
कुष्ठान्यष्टादश भृशमथोत्सेधकं सर्वरूपं प्लीहानञ्च प्रविततरुजं त्वामवातानशेषान्।।
अम्लपित्तशमनी हरणीया वृद्धदोषदमनी रमणीया। कामशुक्रजननी मदनीया पर्पटी क्वन भवेत्कमनीया।।

रसतरं० ६/१४०-१४२

Ingredients

Śuddha pārada - *1 part*

Śuddha gandhaka - *1 part*

Apparatus : Khalva yaytra, Darvī yantra, Vālukā yantra, Aṅghāra Koṣṭhī.

Method : After purifying mercury and sulphur as per the methods prescribed, prepare a *Kajjalī* first. Then it is put in an iron *Darvī* (Spoon round shaped and with long handle) smeared with ghee. Apply slow heat directly or preferably through *Vālukā Yañtra.* After melting, the whole mixture is poured on the *Kadalī* or *Eraṇḍ patra* smeared with ghee and placed on the cow dung mass. This may immediately be covered with another *Kadalipatra* containg fresh cow dung and press the melted material gently to give it a *parpatī* shape (i.e. thin sheets or flakes). After cooling the flakes or the thin sheets of *parpaṭī* may be collected from the leaf and powdered.

Note : For prepareing *'Rasa parpatī'* Sulphur may be purified by giving three to seven *bhāvanās* of *Bhṛṅgarājarasa* and then melting and dipping in *bhṛṅgarāja rasa* and mercury may also be used after purifyhing it by *Jayā rasa, Eraṇḍa-rasa, Bhṛṅgarāja rasa* and *Kākamācī rasa.*

Vardhamaṇa Parpaṭikalpā : Rasa parpaṭi is to be given in a dose of 2 *ratti* on the first day and increased gradually at the rate of 1 *ratti* per day till it attains a maximum dose of 10 *ratti* and then reduced gradually at the rate of 1 *ratti* per day till it reaches to the initial dose of 2 *ratti*. This is called *vardhamaṇa parpaṭikalpā.*

Dose : 1 to 2 *ratti*

Anupāna : Milk, butter milk, Dāḍima Juice or as per the diseases

Therapeutic Uses

Rasaparaṭi is specific for *Grahaṇī roga* and for this it may be used with honey observing dietetic restrictions. Besides *Grahaṇī,* it may be used in Chronic fevers, Chronic *Atīsāra* (diarrhoeas), *Kṣaya, Kāsa, dāha, sotha, arśa, kāmala, śūla, āmavāta, amlapitta, ajīrna, gulma, matibhrama, pāṇḍu, agnimāndya, yakṛt-plīhodara* and *jalodara* etc. diseases.

Swarṇa Parpaṭi

रसोत्तमं पलं शुद्धं हेमतोलकसंयुतम्। शिलायां मर्दयेत्तावद्यावदेकत्वमागतम्।।
गन्धकस्य पलं चैकमयःपात्रे ततो दृढे। मर्दयेद्दृढपाणिभ्यां यावत्कज्जलतां व्रजेत्।।
ततः पाकविधानज्ञः पर्पटीं कारयेत् सुधीः। (भैषज्यरत्नावली ग्रहणी)

Ingredients

1. *Śuddha Pārada* : 4 parts

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2. *Śuddha* Gold leaves : 1 part
3. *Śuddha Gundhaka* : 4 parts

Method : Mix gold leaves with purified mercury and triturate it with lemon juice till gold is mixed completely with mercury. Now wash it with hot water and mix purified sulphur and ground it till *Kajjalī* (black sulphide) is prepared, now prepare its *parpatī* as par the method mentioned.

Dose : Starting from 1 *guñja* and increasing to 10 *guñjas.*

Anupāna : Milk, Honey or as per diseases.

Therapeutic Uses

Pitta śodhana, kṛmihara, bala vardhaka, vṛṣya, grahaṇi, śoṣa, kṣāya , kāsa, śwāsa, prameha, śūla, atisāra, mandagni, pāṇḍu, yakṛtvṛddi.

Vyoma / Gagana Parpaṭi

रसोभागो भवेदेकस्तत्समं व्यामभस्म च । तयोः समं शुद्धगन्धं दत्त्वा कुर्यात्तु कज्जलीम् ।।
रसपर्पटिकाप्रोक्ताविधिना पर्पटी शुभा । कार्या, पाण्डु क्षयं कासं श्वासं मन्दानलं तथा ।।
ग्रहणी चिरजां हन्ति ह्येषा गगनपर्पटी । (सि. यो. सं. -संग्रहणी)

Ingredients

Hinguloṭṭha pārada - 1 part
Kṛṣṇa vajrābhraka bhasma - 1 part
Bhṛngarāja swarasa śodhita gandhaka - 1 part.

Method : Prepare *kajjali* with the processed sulphur by pounding with *hinguloṭṭha pārada*. Then add *Kṛṣṇavajrābhraka bhasma* and pound well and prepare *parpaṭi* as per the procedure. *Gagana* is the synonyms for *abhraka*. As the *parpaṭi* is prepared with *abhraka bhasma* it is called *Gagana parpaṭi*.

Dose : 120 to 360 mg.

Anupāna : *Madhu, kśira, takra or madhura dadima phala rasa.*

Therapeutic Uses

Pāṇḍu, grahaṇi, atiśara , kśāya, kāsa, śwāsa and agnimandhya.

Tāmra Parpaṭī

Ingredients

1. *Tāmra Bhasma* : 3 parts
2. *Śuddha Pārada* : $1^1/_2$ parts
3. *Śuddha Gandnaka* : $1^1/_2$ parts
4. *Vatsanābha* : 1 part.

Apparatus : Khalva yantra, Vālukā yañtra,, Aṅgāra Koṣthī

Method : Prepare *Kajjali* of mercury and Sulphur first, mix *copper bhasma* and aconite powder in the said proportion and ground all well. Now put it in an iron *Darvī* smeared with ghee and apply slow heat sufficient to melt the mixture and then prepare its *parpaṭī* by the same method as mentioned earlier.

Dose : 2 *Guñjā* (250 mg. approximately) as one dose, morninig and evening.

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Therapeutic Uses

In chronic Grahaṇī 3 weeks course is indicated and may be used with honey. For prameha and *Pāṇḍu roga* it may be used with *Triphalā cūrṇa* and honey. For *Śūla-roga* it should be used with caster oil. For *Dadru* and *Switra Kuṣṭha* it should be used with *vākucī bija cūrṇa*. It is also claimed highly useful in liver and spleen disorders.

Vijaya Parpaṭī

Ingredients

1. *Gandhaka* purified with *Bhṛngarāja rasa*	:	4 parts
2. *Śuddha Pārada*	:	2 parts
3. *Raupya bhasma*	:	1 part
4. *Swarṇa bhasma*	:	$^1/_2$ part
5. *Vaikrānta bhasma*	:	$^1/_4$ th part
6. *Muktā bhasma*	:	$^1/_4$ th part

Method : Prepare a *Kajjali* of mercury and sulphur first and then mix all other drugs and prepare a *parpaṭī* using *badarāṅgāra* as fuel.

Dose : Starting from 2 *Guñjā* and increasing to 10 *Guñjās*. Administer it in the morning.

Till the patient is cured or till the dose is increased to 10 *Guñjās*. Then taper the dose by the same method as was increased.

Therapeutic Uses

Chronic and severe type of *Grahaṇī*, even considered *asādhya*. Besides *grahaṇī*, *Āmaśūla*, severe *Āmātisāra*, *Atisāra*, six types of *Arśas*, *yakṣmā* with complications, *Śotha*, *Kāmalā Pāṇḍu*, *Pliharoga*, *Jalodara*, *Pakti-Śūla*, *Āmlapitta*, *Prameha*, *Viṣamajwara*, *Vātapitta-Kaphaja Jwara*, in addition to above this *parpaṭī* makes the body clean and even an old man becomes of good complexion, free from *vali* and *palita*, and lives long i.e. for hundred years.

Note : There is another formula also for this, in which mercury, diamond, gold, silver, pearl, copper and mica *bhasmas* are included in equal parts and sulphur equal to all. It is indicated in chronic and severe type of *Grahaṇī*, *Āmaśūla* and severe type of *Atisāra*.

Śweta Parpaṭi

Ingredients

1. *Śoraka* (purified)	:	4 parts
2. *Sphatikā* (purified)	:	1 part
3. *Narasāra* (purified)	:	1/4th part

Apparatus : Earthen lid, Heater, Kadalīpatra

Method : Take all the drugs in said proportion and mix well. Put them in an Earthen lid or cup and melt by heating on slow fire. It is then poured on the banana leaf smeared with ghee and immediately cover it with another leaf and press. On cooling collect *parpatī* from the leaf and reduce it to powder.

Dose : 4 to 8 *Guñjā* twice daily

Anupāna : Cold water, Coconut water, Compher water of Milk mixed with half water.

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Therapeutic Uses

It is-diuratie, digestive, stimulant. Also acts as anti-flatulence, may be used in *Mūtra Kṛcchra, Mūtra ghāta, Aśmarī, Āmlapitta Agnimāndya,* and *Ādhmāna.*

Note : Śweta parpaṭi does contains *pārada* but, it is mentioned here under the group of *parpaṭi kalpanā* for easy reference.

Sindūra group of compounds

Sindūras are the third group of mercury compounds, prepared through *Kūpīpāka* method. In this group mercury compounds with Sulphur and without Sulphur (both) are included. In first group *Rasa Sindūra, Makaradhwaja* and *Siddha makaradhwaja* deserves mention while in second group *Ras-puṣpa* and *Rasa karpūra* are important. It is important to mention that *sindūra* group of *kalpas* are named on the basis of their red colour like that of *Sindūra.* These are usually prepared by the *Kūpīpāka* method and because of this similarity *Rasa puṣpa* and *Rasakarpūra* are also included into this group though, these are not of red colour like that of *Sindūra.*

Rasa Puṣpa

Synonyms : *Rasasuman, Kusumam, Sadhujani rasa*

शुद्धं तोलकपञ्चकं रसवरं काशीसकं सैन्धवं दत्त्वा चैव समं समं सुमसृणे खल्वे ततः पेषयेत् ।
कूपीमध्यगतं पचेत्तु सिकतायन्त्रेऽथ यामद्वयं नीहारप्रभमूर्ध्वभागनिचितं पुष्पं रसाद्यं हरेत् ।।
जलीयवाष्पे निष्क्रान्ते पिधानेन पिधाय वै । कूपिकाकण्ठदेशस्थां बालुकामपसारयेत् ।।
पुष्पवच्छोभते यस्मात्कूपीकण्ठप्रलम्बितम् । रसपुष्पमिदं तस्मात्प्राणाचार्यैर्निगद्यते ।।

रसतरं० ६

Ingredients

Śuddha pārada	:	60 gms.
Kāsīsa	:	60 gms.
Saindhava lavaṇa	:	60 gms.

Apparatus : Khalva yantra, Kūpi yantra, Vālukā yantra etc.

Method : Take all the three materials in equal parts and ground well in a smooth mortar to make their homoganeous mixture and fill it in *Kācakūpī* and put the same in silkatā yantra and apply heat for two yāmas. In this way Rasa-puṣpa is obtained from the neck portion of the bottle. It is white in colour, and looks like a flower in apperance hence called Rasapuṣpa.

While applying heat the bottle should be observed carefully and when the water vapours stop to come out of the mouth of the bottle, it should be closed with cork and the sand may be removed from all around of the neck of the bottle to get the same cooled.

रसपुष्पं पित्तहरं मूत्रलं व्रणशोषहृत् । परं विरेचनकरं तथा भूतविषापहम् ।।
स्वस्थीकरणमत्यन्तं जलीयांशविशोषणम् । पित्ताशयं तु विक्षोभ्य मलपित्तापसारकम् ।।
क्रिमीन् विषूचिकोद्भूतान् हिक्काञ्चैव फिरङ्गकम् । जलोदरादिकान् रोगान् नाशयत्यविलम्बितम् ।। रसतरं० ६

Dose : $62^1/_2$ to 125 mg.

Direction for use : Should be used in-capsulated in *Drākṣā* or in capsule i.e. should not be allowed to come in contact with the mucous mambrane of the mouth.

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Therapeutic Uses

Viṣūcikā, Jalodara, Phiraṅga roga, Pittaja roga, Hikkā, Kṛimi and *Vraṇa*

Rasakarpūra

Ingredients

1. Pārda purified	:	48 gms.
2. Gandhakāmla (Sulphuric acid)	:	72. c.c.
3. Saindhava lavaṇa	:	Q.S. (i.e. equal to the mixture prepared from 1&2).

Apparatus : Patri dish, spirit lamp, *Kācakūpī, Vālukā yantra,* Glass rod etc.

Method : Mix *Pārada* purified with *Gandhakāmla* in a patridish or flask, heat it over fire (slow) to evaporate its water content. After evaporating water content a white powder of mercury sulphate is obtained which should be mixed with *saiṇḍhava lavaṇa* in equal proportion, grind it well to make a homogeneous mixture. It should be filled in *Kācakūpī* wrapped several times with cloth semeared in mud. It is now heated through *Vālukā yantra* for 2 *Yāmas*. Here also after the evaporation of vapours the mouth is closed with a cork and sealed to allow the product to sublime at the neck. As the deposited material is white in colour similar to that of *karpūra*, it is called *rasakarpūra*.

Dose : 2-4 mg.

Adjuvants : Twak-Cūrṇa, Devakusuma, Candana, Swarṇa-Kṣīrijaṭā powder.

Directions for use : Should be used insulated in capsule.

Therapeutic Uses

All types of *Phiranga rogas, Raktadoṣa, Sphoṭa, Kuṣṭha, Kaṇḍu, Atisāra, Pravāhikā, Kṛmi, Vraṇa, Bhūta* and *Viṣaroga.* According to *Basavarājīyam, Rasakarpūra* is useful for the treatment of 80 varieties of *vāta* disorders, 18 varieties of *kuṣṭa*, 20 varieties of *prameha, duṣṭavraṇa, bhagandhara, udarda, grahaṇi, gulma, rajayakṣma, hikka, anāha, arśas, raktapitta, pinasa* etc.

There is also another formula of *Rasa-Karpūra* mentioned in ancient *Rasa texts*. According to this it contains *Sphaṭikā, Narasāra, Kāsisa, Saindhava, Śoraka, Tuttha* and *Tankaṇa* all in equal amount. Mixed all together and put in an iron pan then heat on a slow fire stirring with a *darvī*. After evaporation of watery content mix *Pārada* equal to all and *pure malla* (Arsenic) *two Karṣa* mix well to make homogeneous mixture. Now apply heat in a *Vālukā yantra* for 12 *Yāmas* after filling the mixture in a *Kācakūpi* as per *Kūpipāka.* In the end it is obtained from the neck of the bottle and known as *Rasa Karpūra.* Its adjuvants are *Devakusuma, Candana* and *Swarṇa Kṣīri Jaṭā powder*. It is indicated in *Phiranga roga* associated with complications. *Jātīrasa* and ghee may be used as *Anupānas* after its administration.

Rasasindūra

Method 1

तिलकाष्टकमितं रसेश्वरं तन्मि तन्च विमलं वलिं हरेत्।
खल्वके खलु विमर्द्य कज्जली भावयेदथ वटांकुराम्बुभिः।।
माषीपात्रसमाकारां सुकृष्णा कांचकूपिकाम्।
सतूलकुट्टितमृदा लेपयेत् खलु यत्नतः।।
त्यापयेतकज्जलीं कांचकुप्यां ततो यत्नतः पाचयेद्वालुकायन्त्रगाम्।

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अग्निवृद्धिकमैजीर्णगन्धे रसे रोधयेद्युक्तितः कांचकूपीमृखम् ।।
वालुकायन्त्रके कांचकूपीमुखात, रोचनासन्निमो नैति धूमोयदा ।
शूतपाककियाज्ञानदक्षैवुधैवदितव्यस्तदा जीर्णगन्धो रसः ।।
नवेश्य कुप्यां खटिकाविधानं जलेन सम्पषितया प्रकामम् ।।
पलेपयेद्वै गुडचूर्णपिरूष्टया ततः प्येद्यामयुगं रसज्ञः ।।
अवबुध्य सदंगशततां खलु बालाहणसुसन्नभम् ।।
गलेदेशविलगनमज्जवलं रससिन्दूर मिहाहरेद् वृघः ।।

(रसतंरगिणी, तरंग ६; १६२-१६७)

Ingredients

1. *Pārada* - *1part*
2. *Gandhaka* - *1part*

Dose : 1-3 Ratti

Anupāna : As per disease

Therapeutic uses

All kinds of diseases.

Method 2

Ingredients

1. *Śuddha Pārada* : *1 part*
2. *Śuddha Gandhaka* : *1 part*

Bhāvanā drugs : 1. *Vaṭāṅkura* juice/decoction

Apparatus : Kāca Kūpī wrapped with cloth and clay seven times all around. *Vālukā yantra,* Iron Mortar and pastel, *Aṅgāra Koṣṭhī.*

Method : Prepare a *Kajjalī* of *Pārada* and *Gandhaka* first in *Khalva yantra,* then *bhāvanā* is given with *Vaṭāṅkura drava* one time. Powder it after drying and fill it in *Kācakūpī,* covered all around with cloth smeared in mud for seven times, upto its $^1/_3$rd. Place it *(Kūpi)* in a *Vālukā yantra* and apply slow, moderate and strong heating gradually increasing the temperature. The mouth of the bottle which was open from the beginning may be closed with cork prepared with chalk or brick of the size of the bottle's mouth. The closing of the bottle mouth should be done only when the extra Sulphur is burnt completely and the fumes of Sulphur similar to *Gorocanā* in colour stops coming out of the mouth of the bottle. The joints of the cork and the mouth should be seald properly with molasses and lime powder made into paste with water. After this the strong heat may be applied for atleast two more hours to allow the prepared compound to sublime and adhere in the neck of the bottle. On cooling the sublimed product *(Rasa sindūra)* may be collected from the neck of the bottle having the red colour similar to the rising sun.

Dose : For one year's child $^1/_{16}$th part of a *Guñjā*, for six year's child $^1/_3$rd part of a *Guñjā*, for 12 years child $^1/_2$ *Guñjā* and for further age group 1 *Guñjā* daily.

Anupāna : Honey, milk, fruit juice, or as per disease.

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Therapeutic Uses

Prameha, Severe *Sūla,* Bhagandara (fissure in anus), severe types of fevers, all types of wasting diseases, and all other diseases.

Besides these, it is claimed as *Yogavāhī, Parama Vṛsya. Balya* (tonic), *Rasāyana* and may produce all types of sexual pleasures. It stimulates bile secretion but does not give rise to purgation. It does not produce any irritation either in *Pittāśaya* or in *Koṣṭha.* It does not give rise to any of the toxic symptoms of mercury even after prolonged use.

Precautions

1. Bottle should not be filled with *Kajjali* more than half of its capacity in any case.
2. *Kūpīmukha* may be kept open from the beginning and till the extra-Sulphur burns completely.
3. Insert the red hot iron rod in the *Kūpī* mouth frequently to help the burning of sulphur and to prevent the choking of the *Kūpi* mouth with sulphur fumes.
4. The mouth of the *Kūpī* should be closed only after the material is converted in to the red sulphide at the bottom of the *Kūpī.*
5. Sealing of the joint of the bottle mouth and the cork may be done properly not allowing any fumes to come out of the bottle.

Late Shri Yadavaji Trikamji Acāryā recommended in his text, *Rasāmṛtam'* and addition of *Navasāra* and *Sphaṭikā* with mercury and sulphur in the contents of *Rasasindūra.* He claims that these help in providing bright red colour to the final product.

Makaradhwaja

स्वणदिषुर्ण सृतं मर्दयेत् त्रिकगन्धकम्। रक्तकापसिकुसुमः कुमार्यद्भिर्विमर्दयेत्।।
शुष्कं काचघटोरूद्ध बालुकायन्त्रगं हठात्। पक्वं कुग्रद्रिसेन्द्र तन्नवार्ककिरणोपमम्।।

(भै. र. वाजीकरणणधिकार २३७-२३८)

Ingredients

1. Swarṇa	-	*1Part*
2. Pārada	-	*8Parts*
3. Gandhaka	-	*24Parts*
4. Rakta Kārpasa Puṣpaswarasa	-	*q.s.*
5. Ghṛta Kumāri Swarasa	-	*q.s.*
6. Aṅkola Mūla Twak Kwātha	-	*q.s.*
7. Nyagrodha Drava	-	*q.s.*

Apparatus : Khalva yantra, Kāca Kūpī, Vālukā yantra, Aṅgāra Koṣṭhī

Method : Mix gold leaves, with purified mercury grind it till gold amalgamates with mercury. Then add sulphur purified in the said proportion and ground it to make good *Kajjalī.* Treat this *(Kajjalī)* with the *Bhāvanā* of red *Kārpāsapuṣpa rasa, Aṅkola mūla twak-kwātha* and with *Ghṛta kumāri rasa.* One *Bhāvanā* of each juice liquid is given. Grinding should be continued till the paste becomes dried. Now fill it in to *Kāca-Kūpī* upto $^1/_3$ rd of its capacity and put it in *Vālukā yantra* and apply heat using dried *Bilvādi* woods. Heating should be done first with mild heat for two *yāmas* then with moderate heat for further two *Yāmas* and there after with strong heat for another two *Yāmas.* In the end it is

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again heated with strong fire for further two *Yāmas* i.e. after closing the mouth of bottle, which is done only after the complete burning of extra sulphur. Mouth of the *Kūpī* is closed with a cork, like that of *Rasasindūra* and sealed properly not allowing any gas/fume to go out of the bottle. In the end it is allowed to cool by itself and on cooling the bottle should be taken out of the *Vālukā Yantra* and brocken to collect the product *(Sindūra)* from the neck of the bottle which is red in colour. This is called *Mūrcchita Sūta.* Collect the gold reduced to ashes from the bottom of the bottle. Because the man who takes it internally becomes like a *Makara* in power hence, the product is also called *Makara dhwaja.*

Dose : 125 to 250 mg.

Anupāna : Honey, betel leaf juice, milk etc.

Mode of administration : Mix *makaradhwaja* 8 parts with the *swarṇa bhasma* 1 part obtained from the bottom of the bottle, add to this *lavanga, kunkuma, jātiphala* and *karpūra* 4 parts each and *Kastūri* 1 part. Ground all well and use with *Tāmbuli dala* in one *valla* or two *valla* quantity.

Diet : Use *madhura* and *snigdha padārthas*, avoid *kaṭu* and *āmla rasa*, use boiled milk with sugar, *godhūma* and ghee as diet.

Therapeutic Uses

It stimulates digestive power, destroys *Jarā* (old age) and *Vyādhies* (diseases). Induces *Medhā* (intelligence), *Āyu* (longevity) and *Kānti* (good complexion) in the body. Acts as very good *Vṛṣya.*

In *Bhaisajya Ratnāvali* another type of *Makaradhwaja rasa* is described which is actually a *khalvīya rasa* insteed of *Kūpīpakwa rasa.* It contains *Rasa Sindūra, Hema Bhasma, Lohabhasma, Devapuṣpa, Candraka, Jātiphala* and *Mṛga mada* (*Kastūri).* All mixed together are triturated with *Tāmbūla rasa* and made into *Vaṭikā* of one *Valla.* It is indicated for *prameha* with goat's milk and in the diseases caused by it. *Klaibya, Dhātu Kṣaya, Kāsa, Jīrna,* and *Viṣama Jwara* are other indications for this preparation.

Siddha Makaradhwaja

The contents of this preparation are the same as of *Makaradhwaja.* The only difference noticed is in the proportion of gold i.e. gold is 4 parts here.

Ingredients

1. Gold leaves purified : 4 parts
2. Mercury purified : 8 parts
3. Sulphur purified : 16 parts

Bhāvanā drugs : Same as for *Makaradhwaja*

Method : Mix gold leaves with mercury first and then add sulphur in double the quantity of mercury and prepare a *Kajjalī.* Treat it with the *Bhāvanā* drugs as in the case of *Makaradhwaja,* Heating in *Vālukā yantra* should be continued till the product is prepared, it is mentioned in the texts that in this preparation sulphur should be made to burn upto six times to mercury to potentiate it further than the ordinary *Makaradhwaja.* Because it was first made by the *siddhas,* hence it is known as *Śrīsiddha-Makaradhwaja.*

Dose : 125 mg. to 250 mg. with honey or other suitable *Anupāna.*

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Therapeutic Uses

Dhātukṣaya, Severe cough, *Prameha, Āntra Śoṣa* and to destroy all the diseases and to produce full sexual pleasure.

Svarṇasindūra

(Bhaiṣajyarantnāvalī, Vājīkaraṇādhikāra; 247-248)

Ingredients

1. *Rasendra (Pārada)* : 48 g
2. *Gandhaka* : 48 g
3. *Hema (Svarṇa)* : 12 g
4. *Vaṭapraroha rasa* : Q.S. (for mardana)

Dose : $62^1/_2$ to 125 mg.

Anupāna : *honey, ghee*

Therapeutic Uses

Śukrakṣaya; Dhātukṣaya; Buddhimāndya.

Mallasindura (Prathama)

नवकर्षमितः सूतो रसचन्द्रञ्च तत्समः । चतुः कर्षमितो मल्लः सार्द्धपञ्चक्षसम्मितः ।।
गन्धकश्चेति तत्सर्व काचकूप्यां निधापयेत् । क्रमवृद्धाग्निना सम्यग्वालुकायन्त्रगं पचेत् ।।
वहिं षोडशयामञ्च दत्वा शीतं समुद्धरेत् । रसोऽयं मल्लसिन्दूरः सर्ववातविकारनुत् ।।
युक्तानुपानतो हन्यात्सन्निपातादिकाग्निदान् । (रसयोगसागरः २३९२)

Ingredients

1 Pārada : 12gm
2 Rasa Karpūr : 12 gm
3 Malla : 48 gm
4 Gandhaka : 60 gm

Dose : 1 ratti

Anupāna : As per disease

Therapeutic Uses

Sannipāta, Śwāsa, Kāsa, Vātavikāra

Khalvīya rasa group of compounds

Agnituṇḍi Ras

(र. सा. सं. अजीर्णचिकित्सा, ३-४)

Ingredients:

1. *Pārada* - *360 gm*
2. *Vatsanābha* - *360 gm*
3. *Gandhak* - *360 gm*

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4. *Ajamoda* - *360 gm*
5. *Triphala* - *360 gm*
6. *Sarjakṣāra* - *360 gm*
7. *Yavakṣāra* - *360 gm*
8. *Citramūlatwak* - *360 gm*
9. *Saindhavalavaṇa* - *360 gm*
10. *Jīraka* - *360 gm*
11. *Saurchala lavaṇa* - *360 gm*
12. *Viḍanga* - *360 gm*
13. *Samudralavaṇa* - *360 gm*
14. *Trikaṭu* - *360 gm*
15. *Viṣamuṣṭi* - *5.040kg*

Dose : 60mg.

Anupāna : Water

Therapeutic Uses

Agnimāndya

Ānanda Bhairava Ras

हिंगुलञ्च विषं व्योषं मरिचं टंकणं कणा । जातिकोषसमं चूर्णं जम्बीरद्रवमर्दितम् ।
रक्तिमानां वटी कुर्यात् खादेदार्द्रकसंयुताम् ।। (र. सा. सं. ज्वराधिकार, १०४)

Ingredients

1. *Śuddha Hingula* : *50 gm*
2. *Śuddha Vatsanabha* : *50 gm*
3. *Śuṇṭhi* : *50 gm*
4. *Pippali* : *100 gm*
5. *Marica* : *100 gm*
6. *Śuddha Taṇkaṇa* : *50 gm*
7. *Jāti Kośa (Jāvitri)* : *50 gm*
8. *Jambhīra Swarasa* : *Appropriate Quantity.*

Dose : 250 mg

Anupāna : *Ardraka Swarasa, Honey, Indrayava Cūrṇa.*

Therapeutic Uses

Jvarātisāra, Āmavāta.

Āmavātari Ras

रसो गन्धो वरा वह्निर्गुग्गुलुः क्रमवर्द्धितः। एतदेरण्डतैलेन श्लक्ष्णचूर्णं प्रपेषयेत्।।
कर्षोऽस्यैरण्डतैलेन हन्त्यष्णजलपायिनाम्। आमवातमतीवोग्रं दुग्धमुद्गादि वर्जयेत्।।
(भै. रा. आमवातचिकित्सा - २९/७१-७२)

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Ingredients

1. *Śuddha Pārda* - *70 gm*
2. *Śuddha Gandhak* - *140 gm*
3. *Triphala* - *210 gm*
4. *Citraka* - *280 gm*
5. *Śuddha guggulu* - *350 gm*
6. *Eraṇḍa taila* - *q.s.*

Dose : 6 ratti

Anupāna : Warm water

Therapeutic Uses

Āmavāta

Bṛhat Vāta Cintāmaṇi Ras

भागत्रयं स्वर्णभस्म द्विभागं रौप्यमभ्रकम्। लौहात् पञ्च प्रवालञ्च मौक्तिकं त्रयसम्मितम्।।
भस्मसूतं सप्तकञ्च कन्यारसविमर्दितम्। वल्लमात्रा वटी कार्या भिषग्भिः परियत्नतः।।
यथाव्याध्यनुपानेन नाशयेद्रोगसंकुलम्। वातरोगं पित्तकृतं निहन्ति नात्र चिन्तनम्।।
वृद्धोऽपि तरूणस्पर्द्धी कन्दर्पसमविक्रमः। द्दष्टः सिद्धफलञ्चायं वातचिन्तामणिस्त्विह।।

(भै. र. वातव्याधि चिकित्सा प्रकरणम् ५०२-५०३)

Ingredients

1. *Swarṇa bhasma* - *120 gm*
2. *Rajata bhasma* - *80 gm*
3. *Abharaka bhasma* - *80 gm*
4. *Lauha bhasma* - *200 gm*
5. *Pravāla bhasma* - *120 gm*
6. *Mauktika bhasma* - *120 gm*
7. *Rasa sindūra* - *280 gm*
8. *Kumāri swarasa* - *q.s*

Dose : 125mg

Anupāna : *Guḍūchi Swarasa, Ajākṣīra, Brāmhi Swarasa, Tāmbula Swarasa, Śankhapuṣpi Swarasa, Madhu.*

Therapeutic uses

Vātapittaja Roga, bhrama, pralāpa

Candrakala Vaṭi

एला सकर्पूरशिला सधात्री। जातीफलं केशरशाल्मली च। सूताभ्रवङ्गायसभस्म सर्व मेतत्समानं परिभावयेत्तु।।
गुडूचिकाशाल्मलिकाकषायै निष्कार्द्धमानां मधुना ततञ्च बद्ध्वा गुड़ी चन्द्रकलेतिसंज्ञा मेहेषु सर्वेषु नियोजयेञ्च।।

(भै. र. प्रमेहः ३७-६७. ६८)

Ingredients

1. *Sukṣma ela bija* *110 gm.*

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2. *Śuddha Karpūr* - *110 gm.*
3. *Śuddha Śilajit* - *110 gm.*
4. *Āmalaki* - *110 gm.*
5. *Jāyaphala* - *110 gm.*
6. *Nāgakeśara* - *110 gm.*
7. *Śālmali* - *110 gm.*
8. *Rasa Sindhūr* - *110 gm.*
9. *Abhrakbhasma* - *110 gm.*
10. *Vaṅgabhasma* - *110 gm.*
11. *Lauhabhasma* - *110 gm.*
12. *Guḍūci Kwāth* - *q.s.*
13. *Śālmali Kwāth* - *q.s.*

Dose : 2 *Māṣa Vaṭi*

Therapeutic Uses

All varieties of *Prameha*

Candrāmṛta Ras

त्रिकटु त्रिफला चबीयम धान्यां जीरका सैदवम रसागंधका लोहाब्रम प्रत्येकमं कारषिशकम शुभम् टंकण द्वियपलं दत्वा वासा नीरेण मर्देयेत गुंजात्रयां प्रमाणनेयना वातीकाम कातहेतुवीसक कासम पंचवेदम चापिसवासंम ज्वारासमांवितम अनूपानाविशेषणं हंती चन्द्रगामरूतो रसहां कासे सारक्ते धातव्या रक्तोपलां रसांपउत: ।

(रसामृत रसायोग वीज्ञानीय - ६७)

Ingredients

1. *Śuṇṭhi* - *186gm*
2. *Marīca* - *186gm*
3. *Pippali* - *186gm*
4. *Haritaki* - *186gm*
5. *Vibhītaki* - *186gm*
6. *Āmālaki* - *186gm*
7. *Cavya* - *560gm*
8. *Dhānyaka* - *560gm*
9. *Jīraka* - *560gm*
10. *Saindhava* - *560gm*
11. *Pārada* - *560gm*
12. *Gandhaka* - *560gm*
13. *Lauhabhasma* - *560gm*
14. *Abhraka bhasma* - *560gm*
15. *Tankaṇa* - *4480gm*
16. *Vāsaswaras* - *q.s*

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Dose : 375mg

Anupāna : *Madhu, Vāsaswarasa, Ārdrakaswarasa, Tāmbulaswarasa, Raktotpalaswarasa.*

Therapeutic Uses

Kāsa, Śwāsa, Jwara.

Caturmukha Ras

रसगन्धकलोहाभ्रं समं सूताङ्घ्रि इेम च। सर्वं खल्लतले क्षिप्त्वा कन्यास्वरसमर्दितम्।।
एरण्डपत्रै रावेष्ट्य धान्यराशौदिनत्रयम्। संस्याच्य च तदुद्घृत्र्य सर्वरोगेषु योजयेत्।।

(भै. र. वाताव्याध्याधिकार, ४६४-४६५)

Ingredients

1. *Ras (Pārad)* - *250 gm.*
2. *Gandhak* - *250 gm.*
3. *Lauhabhasma* - *250 gm.*
4. *Abhrak bhasma* - *250 gm.*
5. *Swarṇa bhasma* - *62.5 gm.*
6. *Kumāriswarasa* - *Q.S.*
7. *Eraṇḍapatra* - *Q.S.*

Dose : 125mg

Anupāna : *Triphala Kwāth, Madhu*

Therapeutic uses

Āmlapitta, Pāṇḍu, Prameha, Dhātukṣaya

Candrakala Rasa

प्रत्येकं कर्षमात्रं स्यात्सूतं ताम्र तथोऽभ्रकम्। द्विगुणं गन्धकं चैव कृत्या कज्जलिकां शुभाम्।।
मुस्तादाडिमद्मवोंत्थैः केतकीस्तनजद्रवैः। सहदेव, कुमार्याश्च पर्पटस्य च वारिणा।।
रामशीतलिकातोयैः शतवर्या रसेन च। भावयितवा प्रयत्नेन दिवसे दिवसे पथक्।।
तिक्ता गुडूचिकासत्वं पर्पटोशीरमाधवी। श्रोगन्धं सारिवा चैषां समानं सूक्ष्मतूर्जितम्।।
द्राक्षाफलकषायेण सप्तथा परिभावयेत्। ततः पोताश्रयं कृत्वा वट्यः कार्याश्चणोपंमा।।

(योगरत्नाकर, मूत्रकृच्छ्रचिकित्सा, पृष्ठ ५४३)

Ingredients

1. *Pārada* - *12 gm*
2. *Tāmra bhasma* - *12 gm*
3. *Abhraka bhasma* - *12gm*
4. *Ghandhak* - *24 gm*
5. *Musta kwātha* - *Q.S.*
6. *Daḍima swarasa* - *Q.S.*
7. *Dūrva swarasa* - *Q.S.*
8. *Ketaki swarasa* - *Q.S.*

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9. *Sahadevi swarasa*	-	*Q.S.*
10. *Kumāri swarasa*	-	*Q.S.*
11. *Parapaṭa kwātha*	-	*Q.S.*
12. *Ramasitalikatoya*	-	*Q.S. (rasa)*
13. *Śatāvari rasa*	-	*Q.S.*
14. *Kaṭuki*	-	*12 gm*
15. *Guḍūchi satva*	-	*12 gm*
16. *Parapaṭa*	-	*12 gm*
17. *Uśīra*	-	*12 gm*
18. *Mādhavi*	-	*12 gm*
19. *Śweta candana*	-	*12 gm*
20. *Śāriva*	-	*12 gm*
21. *Drākṣaphala kaṣāya*	-	*Q.S.*

Dose : 125 to 250mg

Anupāna : *Madhu*

Therapeutic Uses

Rakta pitta, Pitta roga, Vāta pitta roga, Mūtrakṛcra

Garbhacintāmaṇi Ras

रसं तारं तथा लौहं प्रत्येकं कर्षमात्रकम्। कर्षद्वयं तथा चाभ्रं कर्पूरं वङ्गताम्रकम्।।
जातीफलं तथा कोषं गोक्षुरन्च शतावरी। बलातिबलयोर्मूलं प्रत्येकं शुभम्।।
वारिणा बटिका कार्या द्विगुन्जाफलमानतः। सन्निपातं निहन्त्याशु स्त्रीणान्चैव विशेषतः।।
गर्भिण्या ज्वरादाहन्च प्रदरं सूतिकामयम्। (भै. र. स्त्रीरोगाधिकार; ३२६-३२८)

Ingredients

1. *Pārada*	-	*714gm*
2. *Rajata bhasma*	-	*714gm*
3. *Lauaha bhasma*	-	*714gm*
4. *Abhraka bhasma*	-	*1428gm*
5. *Karpūra*	-	*714gm*
6. *Vanga bhasma*	-	*714gm*
7. *Tāmra bhasma*	-	*714gm*
8. *Jātiphala*	-	*714gm*
9. *Jāvitri*	-	*714gm*
10. *Gokṣūra*	-	*714gm*
11. *Śatāvari*	-	*714gm*
12. *Balāmūla*	-	*714gm*
13. *Atibalamūla*	-	*714gm*
14. *Water*	-	*q.s.*

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Dose : 250mg

Anupāna : Water

Therapeutic Uses

Garbhiṇijwara, Pradara, Sūtikaroga.

Gulmakālānala Rasa

पारदं गंधकं तालं ताम्रकं टंकणं समम्। तोलद्वयमितं भागं यवक्षारन्च तत्समम्।।
मुस्तकं पिप्पली शुण्ठी मरिचं गजपिप्पली। हरीतकी वचा कुष्ठं तोलैकं चूर्णयेत् सुधीः।।
सर्वमेकीकृतं पात्रे भावना क्रियते ततः। पर्पटं मुस्तकं शुण्ठ्यपामार्ग पापचेलिकम्।।
तत्पुनश्चूर्णयेत्पश्चात् सर्वगुल्मनिवारणम्। गुन्जाचतुष्टयं खादेद्धरीतक्यनुपानतः।।
वातिकं पैत्तिकं गुल्मं श्लैष्मिकं सन्निपातिकम्। द्वन्द्वन्चनिहन्त्याशु वातगुल्मं विशेषतः।।
श्री मद्गहननाथेन निर्मितो विश्वसम्पदे। (भै० र० गुल्माधिकार; ९१ ९६)

Ingredients

1. Pārada	-	*100 gm.*
2. Gandhaka	-	*100 gm.*
3. Haratāla	-	*100 gm.*
4. Tāmrabhasma	-	*100 gm.*
5. Tankaṇa	-	*100 gm.*
6. Yavakṣāra	-	*100 gm.*
7. Musta	-	*50 gm.*
8. Pippali	-	*50 gm.*
9. Śuṇṭi	-	*50 gm.*
10. Marīca	-	*50 gm.*
11. Gajapippali	-	*50 gm.*
12. Harītaki	-	*50 gm.*
13. Vacha	-	*50 gm.*
14. Kuṣṭa	-	*50 gm.*
15. Parapaṭa kwātha	-	*q.s.*
16. Musta kwātha	-	*q.s.*
17. Śuṇṭhi kwātha	-	*q.s.*
18. Apamārga kwātha	-	*q.s.*
19. Pāṭha kwātha	-	*q.s.*

Dose : 500mg

Anupāna : *Harītaki kwātha*

Therapeutic Uses

Garbhiṇi jwara, Pradara, Sūtika roga.

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Hṛdayārnava Rasa

शुद्धसूतसमं गन्धं मृतताम्रं तयोः समम् । मर्दयेत् त्रिफलाक्वाथैः काकमाचीद्रवैर्दिनम् ।।
चणमात्रां वटीं खादेद् रसोऽयं हृदयार्णवः । काकमाचीफलं कर्ष त्रिफलाफलसंयुतम् ।। द्वात्रिक्त तोलकं तोयं काथम टावषेशितम् । अनुपानं पिबेच्चात्र हृद्रोगे च कफोत्थिते । (र. सा. सं. हृद्रोगचिकित्सा १-१, १/२)

Ingredients

1. *Śuddhaparada* - *250 gm*
2. *Gandhaka* - *250 gm*
3. *Tāmrabhasma* - *500 gm*
4. *Triphala kwātha* - *q.s.*
5. *Kākamācidrava* - *q.s.*

Dose : 125-250 mg

Anupāna : *Kākamaci Kwātha, Triphala Kwātha, Arjuna Cūrṇa, Madhu*

Therapeutic Uses

Kaphajahṛdroga

Ichhābhedi Rasa

शुण्ठी मरिचसंयुक्तं रसगन्धकटंकणम् । जैपालास्त्रगुणाः प्रोक्ताः सर्वमेंकत्र पेषयेत् ।।

(भै. र. उदररोगाधिकार, ८४)

Ingredients

1. *Śuṇṭhi* - *150 gm*
2. *Marica* - *150 gm*
3. *Rasa (Pārada)* - *150 gm*
4. *Gandhaka* - *150 gm*
5. *Taṇkaṇa* - *150 gm*
6. *Jaipāla* - *450 gm*

Dose : 250 mg

Anupāna : Water

Therapeutic Uses

Anāha, udara roga

Jwarāri Abhram

अभ्रं ताम्रं रसं गन्धं विषन्चेतिसमं समम्। द्विगुणं धूर्त्तबीजञ्च व्योषं पञ्चगुणं मतम्।।
जलेन वटिकां कुर्याद् यथादोषानुपानतः। अभ्रं ज्वरारिनामेदं सर्वज्वरविनाशम्।
वातिकान् पैत्तिकांश्चैव श्लैष्मिकान् सान्निपातिकान्। विषमाख्यान् द्वन्द्वजाश्च धातुस्थान् विषज्वरान्।।
प्लीहानं यकृतं गुल्ममग्रमांसं सशोथकम्। हिक्कां श्वासं च कासं च मन्दानलमरोचकम्।।
नाशयेन्नात्र सन्देहो वृक्षमिन्द्राशनिर्यथा।। (भै. र. ज्वर चिकित्सा प्रकरणम् ५/११३५-११३९)

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Ingredients

1. Abhraka	-	*875gm*
2. Tāmra	-	*875gm*
3. Pārada	-	*875gm*
4. Gandhaka	-	*875gm*
5. Vatsanābha	-	*875gm*
6. Dhatūra bīja	-	*1.75kg*
7. Trikaṭu	-	*8.75kg*

Dose : 125mg

Therapeutic Uses

All types of *Jwara, Yakṛt roga, Plīha roga, Gulma, Śotha, Hikka, Swāsa, Kāsa, Agnimāndya, Aruci.*

Jwarāri Rasa

(भै० र० ज्वर चिकित्सा प्रकरणम् ५/ १०५८-१०५०)

Ingredients

1. Hingul	-	*1.200gm*
2. Gandhaka	-	*1.200gm*
3. Pārada	-	*1.200gm*
4. Tāmra bhasma	-	*1.200gm*
5. Nāgabhasma	-	*1.200gm*
6. Abhrakabhasma	-	*1.200gm*
7. Tankaṇ	-	*1.200gm*
8. Vidalavaṇa	-	*1.200gm*
9. Manahśila	-	*1.200gm*

Dose : 1 Ratti

Anupāna : *Ārdrak Swarasa*

Therapeutic Uses

Jwara, Sarvasūlahar, Kaphapittahar.

Jalodarāri Rasa

रसेन गन्धं द्विगुणं शिला च निशा च बीजं जयपालकस्य।
फलत्रयं त्र्यूषणकन्च चित्रं सर्व विचूर्ण्यापि विभावयेच्च।।
दन्तीस्नुहीभृङ्गरसे पृथक् च सम्भाव्य संशोध्य च सप्तवारान्।
वयोबलं वीक्ष्य तथा ददीत जाते विरेके च ददीत पथ्यम्।।
अन्नं सतक्रं शिशिरानुशापि जाते बले तत्पुनरेव दद्यात्।
तक्रेण रोगः समुपैति शान्ति सिद्धो रसो नाम जलोदरारिः।।

(भै. र. उदररोगाधिकार; ७९ ८१)

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Ingredients

1. Pārada	-	*1kg*
2. Gandhaka	-	*2kg*
3. Manahśila	-	*1kg*
4. Haridra	-	*1kg*
5. Jayapala	-	*1kg*
6. Harītaki	-	*1kg*
7. Vibhitaki	-	*1kg*
8. Āmalaki	-	*1kg*
9. Śuṇṭhi	-	*1kg*
10. Marica	-	*1kg*
11. Pippali	-	*1kg*
12. Citrak	-	*1kg*
For Bhāvana		
13. Dantimūlswaras	-	*q.s.*
14. Snuhikṣīra	-	*q.s.*
15. Bhṛngarājaswaras	-	*q.s.*

Dose :125mg

Anupāna : Takra

Therapeutic Uses

Jalodara

Jwarānkuśa Rasa

शुद्धसूतं विषं गन्धं धूत्तबीजं त्रिभिः समम्। चतुर्णा द्विगुणं व्योषं चूर्ण गुञ्जद्वयं हितम्।।
जम्बीरस्य च मज्जाभिरार्द्रकस्य रसैर्युम्। ज्वराङ्कुशो रसो नाम्ना ज्वरान् सर्वान् प्रणाशयेत्।।
ऐकाहिकं द्वचाहिकञ्च त्र्याहिकञ्च चतुर्थकम्। विषमञ्च त्रिदोषोत्थं हन्ति सद्योन संशयः।।

(भै. र. ज्वराचिकित्सा द्वितीय)

Ingredients

1. Śuddha Pārada	-	*500gm*
2. Śuddha Gandhak	-	*500gm*
3. Śuddha Viṣa	-	*500gm*
4. Dhattūr Seeds	-	*1.5kg*
5. Śuṇṭhi	-	*2kg*
6. Marīca	-	*2kg*
7. Pippali	-	*2kg*

Dose : 250mg

Anupāna : *Ādrak swaras, Jambhir swaras*

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Therapeutic Uses

Tridoṣaja jwara, Viṣama jwara.

Karpūra Rasa

हिङ्गुलमहिंफेनञ्च मुस्तकेन्द्रयवं तथा जातीफलञ्च कर्पूरं सवै सम्मर्द्य यत्नतः ।।
जलेन वटिंका कार्या द्विगुञ्चापरिमाणतः । ज्वरातिसारिणे चैव तथाऽतीसारोगिणे ।।
ग्रहणीषट्प्रकारे च रक्तातीसार उल्वणे ।। (भै० र० अतिसार चिकित्सा - १२५, १/२)

Ingredients

1. *Hingula* - *1700gm*
2. *Ahiphena* - *1700gm*
3. *Mūṣṭa* - *1700gm*
4. *Indrayava* - *1700gm*
5. *Jatiphal* - *1700gm*
6. *Karpūr* - *1700gm*

Dose : 125mg

Anupāna : *Madhu, Mūṣṭa Kaṣāya,*

Therapeutic Uses

Jwarātisāra, Pakwātisara, Raspravāhika.

Kāmadūdha Rasa (Tṛtīya)

मौक्तिकस्य प्रवालस्य मुक्ताशुक्तिभवस्य च । वराटिकायाः शङ्खस्य भस्मानि गैरिकं गुडूचिकोद्धवं सत्वं समभागानि कारयेत् । अजाजिकासिताभ्याञ्च गृह्णीयाद्रक्तिकाद्वयम् जीर्णज्वरभ्रमोन्मादपित्त रोगेषु शस्यते । अम्लपिते सोमरोगे योज्यः कामदुघारसः ।।
(रसयोगसागरा ७११-७१३)

Ingredients

1. *Mukta bhasma* - *1450 gm*
2. *Muktasukti* - *1450 gm*
3. *Śankhabhasma* - *1450 gm*
4. *Varāṭika Bhasma* - *1450 gm*
5. *Pravāla bhasma* - *1450 gm*
6. *Gairika* - *1450 gm*
7. *Guḍuci Satwa* - *1450 gm*

Dose : 1-2 ratti

Anupāna : *Śīta, Jīraka Kwātha*

Therapeutic Uses

Jwara, Unmāda, Bhrama, Āmlapitta, Somaroga.

Kaphachintāmaṇi Rasa

हिङ्गुलेन्द्रयवं टङ्कणं त्रैलोक्यबीजमेव च। मरिचं च समं सर्वं सूतभस्म त्रिभागिकम् ।।
आर्द्रकस्य रसेनैव मर्दयेदू याममात्रकम्। चणकाभा वटी कार्या सर्ववातपशान्तये ।।

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कफरोगं निहत्याशु भास्करस्तिमिरं यथा।। (भै. र. कफरोग चिकित्सा प्रकरणम् १०-११)

Ingredients

1. *Hingul* - *1kg*
2. *Indrayav* - *1kg*
3. *Tankaṇa Bhasma* - *1kg*
4. *Bhāng Bīja* - *1kg*
5. *Marīca* - *1kg*
6. *Rasasindhūr* - *3kg*
7. *Ārdrak* - *q.s.*

Dose : 125mg

Anupāna : Water

Therapeutic Uses

All Varieties of *Vāta Roga*

Kaphaketu Rasa

मुक्तासुवर्णेचसमानभागे प्रवालभस्मापि तयोः समानम् अभ्रं च योज्यं द्विगुणं प्रवालातस्वर्णोत्थसिन्दूररसं विकल्प्य।। दुग्धेन नार्या विमलाश्मपात्रे यत्नेन मर्द्य कुशलैभिषग्भिः गुञ्जात्रयं चास्य कफप्रकोपे सेवेत सद्यः कफनाशामिच्छन् (भै. र. कफरोग चिकित्सा प्रकरणम् १२-१३)

Ingredients

1. *Mukta bhasma* - *500gm.*
2. *Swarṇa bhasma* - *500gm*
3. *Pravāla bhasma* - *1.0Kg*
4. *Ābhraka bhasma* - *2.0Kg*
5. *Swarṇasindhūr* - *4.0Kg*

Dose : 3 ratti

Anupāna : Water

Therapeutic Uses

Kaphahara, Kaphaprakopa

Kṛmimudgar Ras

क्रमेण वृद्धं रसगन्धकाजमोदाविडङ्ग विषमुष्टिका च।
पलाशबीजञ्च विचूर्णमस्य गुञ्जाप्रमाणं मधुनाऽवलीढम्।।
पिबेत् कषायं घनजं तदूर्ध्व रसोऽयमुक्तः क्रिमिमुद्गराख्यः।
क्रिमीत्रिहन्ति क्रिमिजांञ्च रोगान्संदीपयत्यग्निगमयं त्रिरात्रात्।।

(भै. र. कृमि रोग चिकित्सा प्रकरणम् ११/ ३२-३३)

Ingredients

1. *Śuddha Pārada* - *480gm*

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2. *Śuddha Gandhak* - *960gm*
3. *Ajāmoda* - *1440gm*
4. *Vāyuviḍanga* - *1920 gm*
5. *Śuddha Kupīlu* - *2400 gm*
6. *Palāsa bīja* - *2880 gm*

Dose : 1 Ratti

Anupāna : *Madhu, Mustā Kwāth.*

Therapeutic Uses

Udarakṛmi, Dīpan.

Kravyāda Rasa

पलं रसस्य द्विपलं वलेः स्याच्छुल्वायसी चार्द्धपलप्रमाणे।
विचूर्ण्य सर्वं द्रुतमग्नियोगादेरण्डपत्रेडथ निवेशनीय् ।।
कत्वाथ तां पर्प्पटिकां विदध्याल्लौहस्य पात्रे वरपूतस्मिन् ।
जम्बीरजं पक्वरसं पलानां शतं नियोज्याग्निमथाल्पमात्रम् ।।
जीर्णे रसे भावितमेतदेतैः (भै. र. रोग चिकित्सा प्रकरणम् ८/२१५ - २२०)

Ingredients

1. *Śuddha Pārada* - *499gm*
2. *Śuddha Gandhak* - *998gm*
3. *Tāmra Bhasma* - *249gm*
4. *Loha Bhasma* - *249gm*
5. *Jambhīri Nimbu Rasa* - *q.s.*
6. *Pancakola Kwāth* - *q.s.*
7. *Amlavetas Kwāth* - *q.s.*
8. *Tankaṇ Bhasma* - *1996gm*
9. *Vīḍalavaṇ* - *998gm*
10. *Marīca* - *4992gm*
11. *Caṇakāmla* - *q.s*

Dose : 2 Ratti

Anupāna : *Takra* with *Saindhavalavaṇa*

Therapeutic Uses

Dīpan, Kārsya, Sthoulya, Garadoṣa, Āmadoṣa, Gulma, Plihavṛddhi, Jalodar, Vātasleṣmavikāra, Sangrahaṇi, Atisāra, Uadararoga.

Kastūri Bhairav Rasa

हिङ्गुलश्च विषं टङ्गं जातीकोषफले तथा। मरिचं पिप्पली चैव कस्तूरी च समांशिका।।
रक्तिद्वयं ततः खादेत् सन्निपाते सुदारूणे।। (भै. र. ज्वर चिकित्सा प्रकरणम् ५/९११.९१२)

Ingredients

1. *Hingul* - *130 gm*

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2. *Vatsanābha* - *130 gm*
3. *Taṇkaṇa* - *130 gm*
4. *Jātipatra* - *130 gm*
5. *Jāyaphal* - *130 gm*
6. *Marica* - *130 gm*
7. *Pippali* - *130 gm*
8. *Kastūri* - *130 gm*

Dose : 2 *Ratti*

Anupāna : *Madhu*

Therapeutic uses

Sannipāta roga.

Līlāvilāsa Rasa

रसोबलिर्व्योमरविस्तु लौहं घात्र्यक्षनीरैस्त्रिदिनं विमर्द्य।
तदल्पघृष्टंमृदुमार्कवेण सम्मर्दयेदस्य हि रक्तिमात्रम्।।
हन्त्यम्लपित्तंविविधप्रकारं लीलाविलासो रसराज एषः।
छर्दिं सशूलां हृदयस्य दाहं निवारयेदेष न संशयोऽत्र।।
दुग्धं सकूष्माण्डरसं सधात्रीफल समेतं ससितं भजेद्वा।

(भै. र. अम्लपित्त चिकित्सा प्रकरणम् ५६/ ३०-३२)

Ingredients

1. *Śuddha Pārada* - *210 gm*
2. *Śuddha Gandhak* - *210 gm*
3. *Abhrak bhasma* - *210 gm*
4. *Tāmra bhasma* - *210 gm*
5. *Lauha bhasma* - *210 gm*
6. *Āmlaki swaras* - *q.s.*
7. *Vibhītaki swaras* - *q.s.*
8. *Bhṛnga rāja swaras* - *q.s.*

Dose : 1 ratti

Anupāna : *Madhu, Kṣīra, Kūṣmāṇḍa swaras, Āmalaki swaras with śarkara.*

Therapeutic Uses

Āmla pitta, Śūla, Vaman, Hṛdaya Dāha.

Loknāth Rasa (Bṛhat)

शुद्धसूतं द्विधा गन्धं खल्ले कुर्याच्च कज्जलीम्। सूततुल्यं जारिताभ्रं मदयेत् कन्यकाऽम्बुना।।
ततो द्विगुणित दद्यात्ताम्रं लौहं प्रयत्नतः। सूतान्नबगुणं देयं वराटीसम्भवं रजः।।
काकमाचीरसेनैव सर्व तद् गोलकीकृतम्। ततो लघुपुटे पच्यात् स्वाङ्गशीतं समुद्धरेत्।।
शिवं सम्पूज्य यत्नेन द्विजातीन् परितोष्य च। भक्षयेदस्य चूर्णस्य द्विगुञ्जं मधुनासह।।

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प्लीहानमग्रमांसन्च यकृतं सर्वरूपिणम्। जीर्णज्वरं तथा गुल्मं कामलां हन्ति दारूणाम्।।

(भै. र.)

Ingradients

1. Śuddh Pārad	-	*60 gm*
2. Śuddh Gandhak	-	*120 gm*
3. Abhrak Bhasma	-	*60 gm*
4. Ghṛt Kumāri Swaras	-	*q.s.*
5. Tāmra bhasma	-	*120 gm*
6. Lauha bhasma	-	*120 gm*
7. Varāṭika bhasma	-	*720 gm*
8. Makoya Swaras	-	*q.s.*

Dose : 2 Ratti.

Anupāna : *Madhu.*

Therapeutic uses

Plīha Vṛddhi, Liver diseases, Jīrṇa jwara, Gulma, Kāmla.

Mugdha Rasa

खटीचूणं शुद्धपात्रे निधान्य विमले जले । प्रक्षालयेद्विधानज्ञो विशुध्यति न संशयः ।।

(र.तरं. ११/२१०)

युगतोलकप्रमाणं विमलीकृतं रसेशम्। द्विगुणां खटीञ्च शुद्धां निदधीत खल्वमध्ये ।।
परिपेषयेत्तु तावत् विधिनैतदीयचूर्णम् । अवलोक्यते न यावत्खलु चन्द्रिकाविहीनम् ।।
हतचन्द्रिकं तु चूर्णं ह्यवबुध्य योजयेद्वै। विबुधैः स्मृतो रसोऽयं खलु मुध्दनामधेयः ।।

(रसतरं० ६/९-११)

उदरामयनुत् वमिहृन्नियतं सहजोत्थफिरङ्गकुरङ्गहरिः। शिशुरोगहरस्तु विशेषतया विबुधैरुदितः खलु मुग्धरसः।।

(रसतरं. ६/१२)

गुञ्जार्धतः समारभ्य सार्धगुञ्जद्वयोन्मिता। पूर्णमात्रा मता मुग्धरसस्य तरुणोचिता ।।
गुञ्जाष्टमांशतश्चास्य गुञ्जापादांशसम्मिता । पूर्णमात्रा मता विज्ञैर्वार्षिकस्यार्भकस्य तु ।।

(रसतरं० ६/१३-१४)

Drugs required

Śuddha Pārada- 2 tola and *khatika* (Chalk) –4 tola

Procedure

Take mercury and chalk in the said ratio in a mortar and pound well till the silvery shining of the *Pārada* disappears. This is known as *Mugdha rasa.*

Dose : 1/2 to 1 *ratti* for adults 1/8th to 1/4th *ratti* for children

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Therapeutic Uses

Mugdha rasa is used in *atisāra, vamana, phiranga roga*, and *udara roga* of the children.

Phiranga Roga : Pregnant women suffering from acute or chronic *phiranga roga* can be relieved by the administreation of *mugdha rasa*.

Māṇikya Rasa

पलं तालं पलं गन्धं शिलाया च पलार्द्धकम्। चपलः शुद्धसीसन्च ताम्रमभ्रमयोरजः।।
एतेषां कोलभागन्च कटक्षीरेण मर्दयेत्। ततो दिनत्रयं धर्मे निम्बक्वाथेन भावयेत्।।
गुडूचीबालहिन्तालवानरीनीलझिण्टिकाः। शोभान्जनमुराजाजी निर्गुण्डीहयमारकम्।।
ऐषां षाणमितं चूर्णमेकीकृत्य सरित्तटे मृत्पात्रे कठिने कृत्वा मृदम्बरयुत्ते दृढे।।
एकाकी पाकविद्वैद्यो नग्नः शिथिलकुन्तलः। पचेदवहितो रात्रौ यत्नात्संयतमानसः।।
तद्विदजानीहि भैषज्यं सर्वकुष्ठ विनाशनम्। सर्पिश मधुना लौहपत्रे तद्दण्डमर्दितम्।।
द्विगुन्जं सर्वकुष्ठानां नाशनं बलवर्द्धनम्। शीतलं सारसं तोयं दुग्धं वा पाकशीतलम्।।
आनीतं तत्क्षणादाजमनुपानं सुखावहम्। वातरक्तं शीतपितं हिक्कान्च दारूणां जयेत्।।
ज्वरान् सर्वान् वातरोगान् पाण्डु कण्डून्च कामलाम्। श्रीमद्गहननाथेन निर्मितो बहुयत्नतः।।

(भै. र. कुष्ठाधिकार; ३००-३०८)

Ingredients

1. *Haratāla*	-	*2400 gm*
2. *Gandhaka*	-	*2400 gm*
3. *Manaśila*	-	*1200 gm*
4. *Pārada*	-	*600 gm*
5. *Nāga bhasma*	-	*600 gm*
6. *Tāmra bhasma*	-	*600 gm*
7. *Abhraka bhasma*	-	*600 gm*
8. *Lauha bhasma*	-	*600 gm*
9. *Vāta Kṣīra*	-	*q.s*
10. *Nimba Kwātha*	-	*q.s*
11. *Guḍūchi*	-	*150 gm*
12. *Hribera*	-	*150 gm*
13. *Tālabheda*	-	*150 gm*
14. *Ātmagupta*	-	*150 gm*
15. *Nīlajhintika*	-	*150 gm*
16. *Śigru*	-	*150 gm*
17. *Mura*	-	*150 gm*
18. *Śwetajiraka*	-	*150 gm*
19. *Nirguṇḍi*	-	*150 gm*
20. *Karavīra*	-	*150 gm*

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Dose : 125-250mg

Anupāna : Dugdha

Therapeutic Uses

Kuṣṭha, Vātarakta, Śītapitta, Hikka, Vātaroga, Pāṇḍu, Kaṇḍu.

Māṇinimanabhanjana Rasa

Ras.Yog.Sag.2559-2566

Ingredients

1. *Pārada* - *1120 gm*
2. *Gandhaka* - *1120 gm*
3. *Vatsanābha* - *1120 gm*
4. *Kṛṣṇābhrakabhasma* - *5600 gm*
5. *Rasabhasma* - *1120 gm*

Dose : 1 *Chaṇaka*

Anupāna : *Tambula, Ksīra.*

Therapeutic uses

Vriṣyam.

Mṛtyuñjay Rasa

विषस्यैकं तथा भागं मरिचं पिप्पलीकणा। गन्धकस्य तथा भागं स्यात् टंकणस्य वै।।
सर्वत्र समभागं स्यात् द्विवभागं हिंगुलें भवेत्। जम्बीरस्या रसेनात्र कार्य हिंगु लशोधनम्।।
रसचेत्समभागं स्यात् हिंगुलंनेष्यते तदा। गोमूत्रशोधितन्चात्र विषं सौरविशौचितम्।।
गुन्जापादमितां पिष्ट्वा खल्लमध्ये वटी चरेत्। (भै. र. ज्वराधिकार, ४०९-४११, १/२)

Ingredients

1. *Viṣa* - *145 gm*
2. *Marīca* - *145 gm*
3. *Pippali* - *145 gm*
4. *Gandhaka* - *145 gm*
5. *Taṇkaṇa* - *145 gm*
6. *Hingula* - *290 gm*

Dose : 125mg

Anupāna : *Mastu, Ārdrak Swarasa*

Therapeutic Uses

Jwara

Nityānanda Rasa

हिगूंलसम्भवं सूतं गन्धकं मृतताभ्रकम्। कांस्यं वङ्गे हरितालं तुत्थं शंखं विदारिका।।
त्रिकटु त्रिफला लौहं विडङ्गं पटुपन्चकम्। चविका पिप्पलीमूलं हपुषा च वचा तथा।।

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शटी पाठा देवदारू एला च वृद्धदारूकम्। त्रिवृता चित्रकं दन्ती गृहीत्वा तु पृथक् पृथक्।।
एतानि समभागानि सन्चूर्ण्य गुडकीकृतम्। हरीतकी रसं दत्वा दशगुन्जोन्मितं शुभम्।।
एकैकं भक्षयेन्नित्यं शीतान्चानुपिबेज्जलम्। श्लीपदं कफवातोत्थं रक्तमांसाश्रितन्च यत्।
मेदोगतं धातुगतं निहन्ति नात्र संशयः। अर्बुदं गण्डमालान्च वातरक्तं सुदारूणम्।।
कफवातोद्भवं रोगमन्त्रवृद्धिं चिरन्तनीम्। वातरक्ते वातकफे गुदरोगे कृमौ तथा।।
अग्नवृद्धि करोत्येष बलं वर्णन्च सुस्थताम्। श्रीमद्गहननाथेन निर्मितो विश्वसम्पदे।।
नित्यानन्दरसश्चायं महाश्लीपदनाशनः। रक्तजे पित्तजे चापि श्लीपदेयोजयेदमुम्।।
नातः परतरं किन्चिद् विद्यते श्लीपदामये। (भै. र. श्लीपदाधिकार ३०-३८)

Ingredients

1. *Hingulotha Pārada* - *340 gm*
2. *Śuddha Gandhak* - *340 gm*
3. *Tāmra bhasma* - *340 gm*
4. *Kāmsya bhasma* - *340 gm*
5. *Vaṅga bhasma* - *340 gm*
6. *Śudha haratāla* - *340 gm*
7. *Śuddha tutha* - *340 gm*
8. *Śankha bhasma* - *340 gm*
9. *Varāṭika bhasma* - *340 gm*
10. *Śuṇṭhi* - *340 gm*
11. *Marīca* - *340 gm*
12. *Pippali* - *340 gm*
13. *Āmalaki* - *340 gm*
14. *Vibhitaki* - *340 gm*
15. *Harītaki* - *340 gm*
16. *Lohabhasma* - *340 gm*
17. *Viḍanga* - *340 gm*
18. *Pancalavaṇa* - *340 gm*
19. *Cavya* - *340 gm*
20. *Pippalimūla* - *340 gm*
21. *Hapuṣa* - *340 gm*
22. *Vaca* - *340 gm*
23. *Kacūr* - *340 gm*
24. *Pātha* - *340gm*
25. *Devadāru* - *340gm*
26. *Ela.* - *340gm*
27. *Vṛddadāru* - *340gm*
28. *Trivṛt* - *340gm*

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29. *Citraka* - *340gm*
30. *Danti* - *340gm*

Dose : 2 Ratti

Anupāna : *Śital jala*

Therapeutic Uses

Ślipadaroga, Arbuda, Gaṇḍamāla, Vātarakta, Gudarog, Kṛmiroga.

Puṣpa Dhanva Rasa

हरजभुजगलौहं चाभ्रकं वंगचूर्ण कनक विजययष्टी शाल्मली नागवल्ली।
घृतमधुसितदुग्ध पुष्पधन्वा रसेन्द्रो रमयति शतरामा दीर्घमायुर्बलंच।। (भै. र. वाजीकरणाधिकार ७०)

Ingradients

1. *Rasa Sindūr* - *210 gm*
2. *Nāga bhasma* - *210 gm*
3. *Lauha bhasma* - *210 gm*
4. *Abhraka bhasma* - *210 gm*
5. *Vanga bhasma* - *210 gm*

For bhāvana

6. *Dhattūra Patra Swarasa* - *q.s.*
7. *Bhanga Kwātha* - *q.s.*
8. *Madhuyaṣṭi Kwātha* - *q.s.*
9. *Śālmali Root Kwātha* - *q.s.*
10. *Nāgarbel Pan Swarasa* - *q.s.*

Dose : 1 Ratti

Anupāna : *Madhu , Ghṛta, Milk.*

Raktapittakulakandhana Rasa

Ras.Yog.Sa-148-150

Ingredients

1. *Pārada* - *167 gm*
2. *Gandhak* - *167 gm*
3. *Pravāla* - *167 gm*
4. *Swarṇamākṣika bhasma* - *167 gm*
5. *Nāga bhasma* - *167 gm*
6. *Vaṅga bhasma* - *167 gm*

Dose : 8 *Ratti*

Anupāna : *Vāsa Swarasa, Madhu.*

Therapeutic uses

Raktapitta

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Rāmabāṇa Rasa

पारदामृतलवङ्गं गन्धकं भागयुग्ममरिचेन मिश्रितम् ।
जातिकाफलमथार्द्धभागिकं तिन्तिडीफलरसेनमर्दितम् ।।
माषामात्रमनुपानयोगतः सद्य एव जठराग्निदीपनः ।
सड़-ग्रहग्रहणिकुम्भकर्णकं सामावातखरदूषणं जयेत् ।।
वहि, नमान्द्यदशवक्त्रनाशनो रामबाण इति विश्रुतोरसः ।।

(भै. र. अग्निमान्द्यादिरोगाधिकार; १०; ९० ९२)

Ingredients

1. *Śuddha Pārada* - *155 gm*
2. *Śuddha Gandhak* - *155 gm*
3. *Śuddha Vatsanābha* - *155 gm*
4. *Saindhava lavaṇa* - *155 gm*
5. *Marica* - *310 gm*
6. *Jāyaphal* - *775 gm*

Dose : 2 *Māṣa*

Anupāna : *Madhu, Bharjita Jirak Cūrṇa*

Therapeutic uses

Dīpan, Saṅgrahi, Āmavata, Agnimāndhya.

Smṛtisāgara Rasa

R.Y.S 2449-2451

Ingredients

1 *Pārada* - *167 gm*
2 *Gandhaka* - *167 gm*
3 *Haratāla* - *167 gm*
4 *Manahśila* - *167 gm*
5 *Swarṇa Mākṣika* - *167 gm*
6 *Tāmra bhasma* - *167 gm*

Dose : 1 *Māṣa*

Anupāna : *Ghee*

Therapeutic Uses

Apasmāra.

Sūtasekhara Rasa

शुद्ध सूतं मृतं स्वर्ण टंकणं वत्सनाभकम् । व्योषमुन्मत्तबीजं च गन्धकं ताम्रभस्मकम् । चतुजतिं शंखभस्म बिल्वगज्जा कचोरकम् सर्व समं क्षिपेत्खल्वे मद् यं भृंगरसैदिनम् गुञ्जामात्रां वटी कृत्वा दिवगुंजे मधुसर्पिषी ।

(योगरत्नाकर, अम्लपित्तचिकित्सा, पृ. ७०५)

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Ingredients

1. Śuddha Pārada	-	*60 gm*
2. Swarṇa Bhasma	-	*60 gm*
3. Tankaṇa	-	*60 gm*
4. Vatsanābha	-	*60 gm*
5. Śuṇṭhi	-	*60 gm*
6. Marīca	-	*60 gm*
7. Dattūrabija	-	*60 gm*
8. Pippali	-	*60 gm*
9. Gandhak	-	*60 gm*
10. Tāmrabhasma	-	*60 gm*
11. Ela	-	*60 gm*
12. Twak	-	*60 gm*
13. Tejapatra	-	*60 gm*
14. Nāgakeśara	-	*60 gm*
15. Śankhabhasma	-	*60 gm*
16. Bilwamajja	-	*60 gm*
17. Kapūrkacūr	-	*60 gm*
18. Bhṛngarājaswarasa	-	*q.s.*

Dose : 125mg

Anupāna : *Madhu, Ghṛta*

Therapeutic Uses

Āmlapitta, Chardhi, Gulma, Kāśa, Grahaṇi, Tridoṣajātisara.

Śirahaśūladivajra Rasa

पलं रसं पलं गन्धं पलं लौहं पलं रविः। गुग्गुलोः पलचत्वारि तदर्द्धं त्रिफलारजः।।
कुष्ठं मधु कणा शुण्ठी गोक्षुरं कृमिनाशनम्। दशमूलन्च प्रत्येकं तोलकं वस्त्रशोधितम्।।
क्वाथेन दशमूल्याश्च यथांशं परिभावयेत्। घृतयोगात् प्रकर्तव्या वेदगुन्जामिता वटी।।
छागीदुग्धानुपानेन पयसा मधुनाऽथवा शिरः शूलाद्रिवज्रोऽयं चण्डनाथेन भाषितः।।
एकजं द्वन्द्वजन्चैव त्रिदोषजनितं तथा। वातिकं पैत्तिकं पूर्व शिरोरोगं विनाशायेत्।।

(भै. र. शिरोरोगाधिकार; ५५-५९)

Ingredients

1. Pārada	-	*72 gm*
2. Gandhaka	-	*72 gm*
3. Lohabhasma	-	*72 gm*
4. Tāmrabhsama	-	*72 gm*
5. Śudddhaguggulu	-	*288 gm*
6. Triphala	-	*144 gm*
7. Kuṣṭa	-	*18 gm*

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8. *Madhuyaṣṭi* - *18 gm*
9. *Pippali* - *18 gm*
10. *Śuṇṭhi* - *18 gm*
11. *Gokṣūra* - *18 gm*
12. *Viḍaṅga* - *18 gm*
13. *Bilwa* - *18 gm*
14. *Agnimantha* - *18 gm*
15. *Śyonaka* - *18 gm*
16. *Gambhāri* - *18 gm*
17. *Pāṭhala* - *18 gm*
18. *Śāliparṇi* - *18 gm*
19. *Pṛṣṇaparṇi* - *18 gm*
20. *Bṛhati* - *18 gm*
21. *Kaṇṭakāri* - *18 gm*
22. *Gokṣūra* - *18 gm*
23. *Daśamūla Kwāth* - *q.s.*
24. *Goghṛt* - *q.s.*

Dose : 250-500mg

Anupāna : *Goatmilk, Madhu, Water*

Therapeutic Uses

Śiroroga

Śringārābhara Rasa

शुद्धं कृष्णाभ्रचूर्णं द्विपलपरिमितं शाणमानं यदन्यत् ।
कर्पूरं जातिकोषं सजलमिभकणा तेजपत्रं लवङ्गम् ।।
मांसी तालीशचोचं गजकुसुमगदं धातकी चेति तुल्यम् ।
पथ्याधात्री विभीतत्रिकटुरपि पृथक् त्वर्द्धशाणं द्विशाणम् ।।
एलाजातीफलाख्यं क्षितितलविधिना शुद्धगंधाश्म कोलम् ।
कोलार्द्धं पारदस्य प्रतिपदविहितं पिष्टमेकत्र योज्यम् ।।
पानीयेनैव कार्यं परिणतमरिचस्विन्नतुल्याश्च वट्यः ।
प्रातः खाद्या द्विवट्यस्तदनु च कियच्छृङ्गवेरंसपर्णम् ।।
पानी पीतमन्ते ध्रुवमपहरति क्षिप्रमेतान् विकारान् ।
कोष्ठे दुष्टाग्निजातान् ज्वरमुदररूजो राजयक्ष्म क्षयन्च ।।

(भै. र. राजयक्ष्माधिकार; २१२-२१६)

Ingredients

1. *Abhraka bhasma* - *5280gm*
2. *Karpūra* - *220gm*
3. *Jātiphala* - *220gm*
4. *Hrivera* - *220gm*
5. *Gajapippali* - *220gm*

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6. Tejapatra	-	*220gm*
7. Lavanga	-	*220gm*
8. Jatamānsi	-	*220gm*
9. Tālispatra	-	*220gm*
10. Twak	-	*220gm*
11. Nāgakeśara	-	*220gm*
12. Kuṣṭa	-	*220gm*
13. Dhātakipuṣpa	-	*220gm*
14. Haritaki	-	*110gm*
15. Āmalki	-	*110gm*
16. Bibhataki	-	*110gm*
17. Śuṇṭhi	-	*110gm*
18. Marīca	-	*110gm*
19. Pippali	-	*110gm*
20. Ela	-	*440gm*
21. Jātiphala	-	*440gm*
22. Gandhaka	-	*440gm*
23. Pārada	-	*220gm*
24. Jala	-	*q.s.*

Dose : 125-250mg

Anupāna : *Ādraka Swarasa, Tāmbulapatra swarasa*

Therapeutic Uses

Jwara, Udaraśūla, Rājyakṣma, Kāsa, Śwāsa, Śoṣa, Prameha, Manovikar, Chhardi, Āmlapitta, Gulma, Pāṇḍu, Raktapitta, Pinasa, Pliharoga.

Śwāsa Kuṭhār Rasa

रसो गन्धो विषं चैव टंकण च मनः शिला । एतानिटंकमात्राणि मरिचं चाष्टअंक्कम् ।
एकैकं मरिचं दत्वा खल्वे सूक्ष्मं विमर्दयेत् । सर्वमेकत्र संयोज्य काचकूप्यां विनिक्षिपेत् ।।

(योगरत्नाकर, श्वासचिकित्सा; पृ० ३७३)

Ingredients

1. Śuddha Pārada	-	*72 gm*
2. Śuddha Gandhaka	-	*72 gm*
3. Śuddha Vatsanābhi	-	*72 gm*
4. Śuddha Tankaṇa	-	*72 gm*
5. Śuddha Manahśila	-	*72 gm*
6. Marīca	-	*576 gm*
7. Pippali	-	*24 gm*
8. Marīca	-	*24 gm*

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9. Śuṇṭi - *24 gm*

Dose : 125mg to 250mg

Anupāna : *Madhu*

Therapeutic Uses

Agnimāndhya, Kāsa, Śwāsa, Vātakaphajaroga.

Tribhuvanakirti Rasa

हिंगुलं च विषं व्योषं टंकणं मागधीशिफाम् । संचूर्ण्य भावयेत्रेधा सुरसार्द्रकहेमभिः ।।
निर्गुण्डीस्वरसेनापि, रसस्त्रैलोक्यकीर्तिकः । (रसामृत, रसयोगविज्ञानीय, अध्याय ९;८०-८०)

Ingredients

1. Hingula	-	*725 gm*
2. Śuddha Viṣa (Vatsanābha)	-	*725 gm*
3. Śuṇṭhi	-	*725 gm*
4. Marīca	-	*725 gm*
5. Pippali	-	*725 gm*
6. Śuddha Tankaṇa	-	*725 gm*
7. Pippalimūla	-	*725 gm*
8. Tulasi svarasa	-	*Q.S.*
9. Ārdraka svarasa	-	*Q.S.*
10. Dhattūra Svarasa	-	*Q.S.*
11. Nirguṇḍi Svarasa	-	*Q.S.*

Dose : 125 to 250 mg.

Anupāna : *Madhu, Tulasi rasa, Ārdraka rasa.*

Therapeutic uses

Vāta Kapha Jvara.

Vasantakusumākara Rasa

द्विभाग हाटकं चन्द्रं त्रयो वंगाहिकान्तकाः। चतुर्भागिं शुद्धधमभ्रं प्रवालं मौक्तिकं तथा भावयेद् गव्यदुग्धेन भावनेक्षुरसेन च वसालाक्षारसोदीच्यरम्भा कन्दप्रसूनकै शतपत्ररसेनैव मालत्या कुसुमोदकैः पश्चान्मृगमदैर्भव्यिं सुसिद्धो रमराड्भवेत कुसुमाकर विख्यातो वसन्तपदपूर्वकः गुंजाद्वयेन संसेव्यः सितामध्याज्यसंयुतः ।

(रसेन्द्रसारसंग्रह, रसायनवाजीकरणाधिकार; ८०-८३)

Ingredients

1. Śwarṇabhasma	-	*80 gm*
2. Rajatabhasma	-	*80 gm*
3. Vaṅgabhasma	-	*120 gm*
4. Nāgabhasma	-	*120 gm*
5. Kāntalohabhasma	-	*120 gm*
6. Abhrakabhasma	-	*160 gm*

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7. Pravālabhasma	-	*160 gm*
8. Muktābhasma	-	*160 gm*
9. Godugdha	-	*q.s.*
10. Ikṣu Swarasa	-	*q.s.*
11. Vāsa Swarasa	-	*q.s.*
12. Lākṣa Swarasa	-	*q.s.*
13. Udicya (Sugandabāla) Swarasa	-	*q.s.*
14. Kadali Swarasa	-	*q.s.*
15. Gulabpuṣpa Swarasa	-	*q.s.*
16. Mālatipuṣpa Swarasa	-	*q.s.*
17. Kastūri	-	*q.s.*

Dose : 125-250 mg

Anupāna : *Madhu, milk*

Therapeutic Uses

Prameha, Bali, Palit, Smṛtibhramsa, Kṣaya, Somaroga

Vasantāmalati Rasa

स्वर्ण मुक्ता च दरदं मरिचं भागवृद्धितः। खर्पय्यष्टौ कलांश स्यान्नवनीतं प्योभवम्। निम्बूकैमंर्दयेत्तावद्यावत् स्नेहो लेयं ब्रजेत्। मालती प्रावसन्तोऽयं रसो धातुज्वरं जयेत्। मात्रा गुंजाद्वयोन्माना कणा-मधु-चमत्कृता प्रकंच-पंचके पंचनवति निम्बुकान्यलम् ।। (सिद्धभैषज्य मणिमाला, ज्वरप्रकरण; ६०-६२)

Ingredients

1. Swarṇabhasma	-	*6 gm*
2. Muktābhasma	-	*112 gm*
3. Hingula	-	*168 gm*
4. Marīca	-	*224 gm*
5. Kharpara bhasma	-	*448 gm*
6. Navanita	-	*3.5 gm*
7. Nimbuswarasa	-	*q.s.*

Dose : 125-250mg

Anupāna : *Pippalicūrṇa, Madhu*

Therapeutic uses

Jirṇakāsa, Viṣamajwara, Jīrṇajwara

Vātakulāntak Rasa

मृगनाभिः शिला नागकेशरं कलिवृक्षजम्। पारदं गन्धकं जातीफलमेलालवंगकम्।।
प्रत्येकं कार्षिकन्चैव श्लक्ष्चूर्णन्च कारयेत्। जलेन मर्दयित्वा तु वटीं गुंजार्धसाम्मिताम्।।

(भै. र. अपस्माराधिकार; ४०-४१)

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Ingredients

1. *Mṛganābhi* - *120 gm*
2. *Manahśila* - *120 gm*
3. *Nāgakeśara* - *120 gm*
4. *Vibhītaki* - *120 gm*
5. *Pārada* - *120 gm*
6. *Gandhaka* - *120 gm*
7. *Jātiphala* - *120 gm*
8. *Ela* - *120 gm*
9. *Lavanga* - *120 gm*
10. *Jala* - *Q.S. (For mardhan)*

Dose : 125 to 250 mg

Anupāna : *Brāhmi Rasa, Milk,Vaca Cūrṇa*

Therapeutic Uses

Apasmāra, Mūrcha, Vātaroga

Yogendra Rasa

विशुद्धं रस सिन्दूरं तदर्द्ध शुद्धहाटकम्। तत्समं कान्तलौह च तत्सम चाभ्रमेव च।।
विशुद्धं मौक्तिक चैव वंग च तत्समं मतम्। कुमारिकारसैभव्यिं धानराशौदिनत्रयम्।।
ततो रक्तिद्वसमितां वर्टी कुर्यादिवचक्षणः। (भै. र. वाताव्याध्याधिकार, ५०६-५०७, १/२)

Ingredients

1. *Rasa Sindhūr* - *286 gm*
2. *Swarṇa bhasma* - *143 gm*
3. *Kāntaloha bhasma* - *143 gm*
4. *Abhraka bhasma* - *143 gm*
5. *Mukta bhasma* - *143 gm*
6. *Vaṅga bhasma* - *143 gm*
7. *Kumāri Swaras* - *Q.S.*

Dose : 125 to 250mg

Anupāna : *Triphala Kwātha, Madhu*

Therapeutic uses

Bahumūtrata, Prameha,Vātaroga, Apsmāra, Pakṣāghat, Bhagandar, Arsa.

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Chapter 6

MAHARASA

Along with *Pārada*, many other substances of animal, plant origines as well as various oceanic products are used to prepare potent medicines. The range of these substances vary from simple and easily available substances like Mica, to potently poisonous drugs like Arsenic compounds, from comparatively cheaper substances like *Gairika* to precious stones like Diamonds, purely plant products like *Kampilla* to still ambiguous substances like *Kankuṣṭha*. All these substances were used by the ancient research workers in experimentations upon Mercury. If development of *Rasaśāstra* over period of hundreds of years is considered, it can be seen that many of the substances were proved of little use while many useful new substances were discovered. Hence need to classify these substances was felt and every famous researcher and author of the classical texts developed his own method of classification of substances. Many new concepts were cleared over a period of hundreds of years and hence it is natural that the criteria on which classification is based and nomenclature of various classes, change from text to text. The classification stated in one of the still respected and honoured text viz. Rasaratnasamuchchaya is considered as base line for comparison with other systems of classification.

Substances were mainly included in following classes : *Maharasa, Uparasa, Sadharana rasa.*

अभ्रवैक्रान्तमाक्षीकविमलाद्रिजसस्यकम् । चपलो रसकश्चेति ज्ञात्वाऽष्टौ संग्रहेद्रसान् ।। र. र. स. २/१

रसकं विमला ताप्यं चपला तुत्थमन्जनम् । हिगुंलं सस्यकंश्चैव ख्याता एते महारसाः ।। र. र. स. ६/५०

वैक्रान्तकान्तसस्यकमाक्षिकविमलाद्रिजदरदरसकाश्च । अष्टौ रसास्तथैषां सत्त्वानि रसायनानि स्युः ।।

र. ह. त. ९/४

Mahārasa is a group of minerals which have been recognised most useful for the potentiation of the properties of *Rasa (mercury)*. Almost all the *Rasa texts* have advised to include eight drugs in this group but different authors have made slight variation as regards the drugs, which is probably based on their experiences. In all, thirteen (13) durgs/minerals come under this group. Besides the eight drugs mentioned in *Rasa Ratna Samuccaya, kānta, darada, añjana, tuttha,* and *rājāvarta* are also included under this group by different authors. The textwise mention of drugs of this group are shown in the following table.

Sl.	*Name of drugs*	*Rasa Ratna. Samuccaya*	*Ṛasārṇava*	*Rasa Hṛdaya Tantra*	*Rasa Ratnākara*	*Rasa prakāśa Sudhākara*
1.	*Abhraka*	+	-	-	-	+
2.	*Vaikrānta*	+	-	+	-	+
3.	*Mākṣika*	+	+	+	+	+
4.	*Vimala*	+	+	+	+	+
5.	*Adrija*	+	+	+	-	+
6.	*Sasyaka*	+	+	+	+	+
7.	*Capala*	+	+	-	+	-
8.	*Rasaka*	+	+	+	+	+
9.	*Kānta*	-	-	+	-	-
10.	*Darada*	-	+	+	+	-
11.	*Añjana*	-	+	-	+	-
12.	*Tuttha*	-	-	-	+	-
13.	*Rājāvarta*	-	-	-	-	+

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ABHRAKA

Abhraka (*Mica*) is a transluscent and Lustrous mineral, easily split in to thin layers. *Abhraka* is produced in under ground with the combination of water content in 4 to 6%. According to *Āyurveda (Rasaśāstra), Abhraka* is a Khanija dravya and it is mainly used for preparation of *Abhraka Bhasma*. Among the *Abhraka vareties Kṛṣṇa -Vajrābhraka* (*biotite-mica*) is acceptable variety. Biotite is collected from mines of Bihar, Andhra Pradesh and Rajasthan. Two varieties of mica is available in the raw drug trade. The White (अभ्रक-सफेद) is muscovite and the black (अभ्रक-काला) one is biotite. *Abhrak-Kāla*, which is for *Abhraka bhasma* preparation. The other variety of *abhraka*, that is *Śwetābhraka (Muscovite)* is used in *Āyurveda* for preparing *Rasamāṇikya* (not as an ingredient, but as a heat regulator). *Kṛṣṇābhraka* (biotite) is in black colour and it contains iron. According to *Śānskṛit Śabda Kośa* 'अभ्रक' word is produced from 'अभ्र' word. 'अपो बिभर्ति इति अभ्रम्' The substance whichever containing water content, that is called 'अभ्र' In relation to this, अभ्र word also synonim for clouds. Apart from this, अभ्र word is also synonim for आकाश (Sky). The substance which will able to produce sounds like clouds as well as appears like as clouds is called *abhraka.* According to *Raseśwara Darśana, Abhraka* Origin is considered from *Māta Pārvati. Abhraka* is used in *Rasasastra* for *Abhraka Satwapātana, Abhrakadhṛti, Abhrakagrās, Abhraka Cārana, Abhraka Jāraṇa, Rasapakṣacched* with *Abhraka, Abhrakavedh Kriya* etc. different purposes.

Group	:	Mahārasa varga, Rasavarga, Śakti Varga,Uparasa Varga and Upadhātu Varga.
Śānskṛt	:	Abhrakam, Abhraka
Hindi	:	Abhrak, Abarak, Bhodal
Trade name	:	Abhrak-kāla
Latin	:	Maika
English	:	Mica- Biotite
Chemical Composition	:	Potassium Iron Mạgnesium Aluminium Silicate Hydroxide Floride.
Sp. Gr.	:	2.7-3.2.
Density	:	2.8 – 3.4, Average = 3.09
Diaphaniety	:	Transparent to translucent to opaque

Synonyms

Abhrakam, Abhram, Anantakam, Ambaram, Amalam, Antariksam, Abdam, Ajaram, Amṛtam, Ākasam, Kham, Khecharam, Gaganam, Garajādhwajam, Gaganāhvayam, Girijābijam, Girijāmalam, Girijam, Ghanam, Ghanāhvayam, Nirmalam, Bhṛngam, Bhekam, Megham, Paṭalam, Bahupatram, Vyomam, Vajram, Varapitakam, Śubhram, Svachham.

Availability

Biotite is a common rock forming mineral, being present in most igneous, both regional and contact metamorphic rocks. The typical black to brown color of biotite is characteristic although it is difficult to distinguish brown biotite from dark brown phlogopite. The two are actually end members in a series that is dependent on the percentage of iron. Phlogopite is iron poor and Biotite is iron rich. The darker color and density increase with an increase in the iron content. Biotite tends to form in a wider range of conditions than phlogopite, which is limited mostly to ultramafic rocks and magne-

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sium rich marbles and pegmatites. Biotite, like other micas, has a layered structure of iron magnesium aluminium silicate sheets weakly bonded together by layers of potassium ions. These potassium ion layers produce the perfect cleavage.

In India Biotite mica is very commonly available in Rajasthan, Andhra Pradesh, Bihar States. The Biotite comes from the Bihar mica belt, which extends for a distance of some 145 kms. from the Gaya district on the west through Hazaribagh and Monghyr districts to Bhagalpur district on the east. In Andhra Pradesh, the Nellore mica belt is the most important producing area. The belt covering the Gudur, Rapur including Podalakur, Atmakur and Kavali taluks. In Rajasthan, important deposits of mica are found in Bhilwara, Ajmer, Rajasamand, Tonk districts and in Shahpura. The Bhilwara district which produces the largest quantity of Mica in Rajasthan.

World's leading producers of mica were : U.S.S.R., India, Union of South Africa.

Still the best quality of sheet or block mica is obtainable only from India.

Main sources of mica were located in India are Bihar, Andhra Pradesh, Rajasthan

The important importing countries included Japan, U.S.A., U.K. and U.S.S.R.

Varieties

On the basis of colour- Four varieties of *abhraka* are mentioned. They are 1. *Śweta* 2. *Rakta* 3. *Pita* and 4. *Kṛṣṇa*. Out of these *Kṛṣṇa* (black) *abhraka* (biotite-mica) is considered as acceptable variety for *abhraka bhasma* preparation.

On the basis of agni parikṣa - Abhraka when it is exposed to *agni* (temperature), certain changes will be found, on the basis of these changes *Abhraka* is classified in following books viz: *Rasa Ratna Samucchaya, Rasamitra, Rasajalanidhi* etc.

Pināka – When heated its layers are separated.

Nāga – When heated it produces hissing sound like a *Nāga* (Snake)

Maṇḍūka – When heated this breaks into pieces or jumps like a frog.

Vajra – This remains unchanged on heating and it is considered as acceptable variety for *abhraka bhasma* preparation.

On the basis of Deśa

According to *Rasatarangini* and *Bhāvaprakāśa, Abhraka* is classified on the basis of *Deśa*.

1. Uttara śailottha *2. Pūrva Śailottha* *3. Daikṣiṇa Śailottha*

Varieties of *Abhraka* according to *Rasaprakāś Sudhakara, Rasārṇava, Rasendra Sāra Sangraha, Rasendra Purāṇa, Loha sarvasva. Abhraka* is classified in to four varieties.

1. Pināka *2. Nāga* *3. Dardura* *4. Vajra*

According to *Rasārṇava, Abhraka* is classfied on the basis of colour.

1. Rakta *2. Pīta* *3. Śukla* *4. Kṛṣṇa*

According to *Rasendra cintāmaṇi* and *Śārangadhara saṁhitā*.

1. Vajra *2. Mekavapu* *3. Kṛṣṇa*

After considering all above *Abhraka* classifications, total *Abhraka* varieties can be summarised into following manner :

1. Pināka	-	*Brāhmaṇa*	-	*Śweta*
2. Nāga	-	*Kṣatriya*	-	*Rakta*

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3. Maṇḍūka	-	*Vaisya*	-	*Pīta*
4. Vajra	-	*Sūdra*	-	*Kṛṣṇa*

Kṛṣṇābhraka

स्निग्ध्यं पृथुदलं वर्णसंयुक्तं भारतोऽधिकम्। सुखनिर्मोच्यपत्रं च तदभ्रं शस्तमीरितम्।। र. र. स. २/११

Properties of acceptable variety of abhraka : Acceptable variety is called *Kṛṣṇa vajrabjhraka* (*Biotite mica*). It remains unchanged on heating. Biotite contains Iron. It is having the colour similar to *Nilanjana* or *Kajjali* (Black colour). Apart from this it should have the following characters viz, *snigdha*, *bhārapurṇa*, *mahojwal*, *mṛdu*, collected from the mines, having thick leaves and produces *satwa*. Biotite also should have the uniform chemical formula.

Reasons for advising *Kṛṣṇābhraka* by ancient *Āyurvedic Physicians* :

1. Rich iron content present.
2. Iron which is extracted in the form of *Abhraka Satwa*, is possesing more therapeutic value.
3. Because of its availability in India.

Best Characters of Kṛṣṇābhraka : After considering all the factors in *Āyurvedic System*, Ancient *Rasācārya's* has selected the *Kṛṣṇābhraka* variety for the manufacturing of *Abhraka Bhasma*, on the basis of certain physical and chemical characters.

Identification of acceptable Varieties

According to *Rasārṇava, Rasendra sāra sangraha*, *Rasendra purāṇa*, *loha sarvasva*, of certain physical and chemical examinations are mentioned below :

Acceptability and un-acceptability of Abhraka on the basis of Agnipariksa

S.No.	*Variety of Abhraka*	*Results of Agnipariksa*	*Changes in the body after its administration*
01.	Pināka Un-acceptable	Seperates into leaves	Malavibhandh, Mṛtyukarak, Kuṣṭa, Kṛmikara
02	Naga Un-acceptable	Sound will be produced	Bhagandar, Maṇḍal, Mahakuṣṭa, Kṣayaroga equal to halahala viṣa
03.	Maṇḍuka Dardur - Rasarṇav un-acceptable	Sound will be produced like frog and get seperates into 2 parts	Complicated asmari, granthi, mṛtyukari
04.	Vajra Acceptable	Nochanges	Mahavyādhihar, Dehasiddikari, jaranāsaka, Mṛtyuhar, Sarvaroganāsak, Body will become into strong as that of vajra

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According to *Āyurveda (Rasaśāstra)* basically micas are divided into four varieties on the basis of their colors vize : white, red, yellow and black. They could be correlated with the following varieties described in modern literature :

1. Śweta – Muscovite *2. Rakta-Lepidolite*

3. Pita-Phlogopite *4. Kṛṣṇa-Biotite.*

The Kṛṣṇa (Vajra) Abhraka – Biotite is considered as acceptable varietiety.

Characters of acceptable Variety as Per Āyurveda

(1) *Abhraka* should have the colour similar to *nilāñjana* or *Kajjali.*

(2) No changes will be obtained by *agniparīkṣa.*

(3) *Snigdha*

(4) *Bhārapūrṇa*

(5) *Mahojwal*

(6) Easily get seperates into leaves

(7) *Mṛdu*

(8) Having thick leaves

(9) Produces *Satwa*

Characters of acceptable Variety as Per Modern

Having uniform chemical formula, Having black colour, Having the shininess, Transparant, Should have the hardness in between 2.5 to 3.0, Should have Iron and megnesium.

According to modern (Biotite – Black Mica-Iron Mica)

Name Origin	:	Named after the French physicist, Jean Baptiste Biot (1774-1862), who studied the optical properties of the micas.
Synonyms	:	Iron Mica, Lepidomelane (Fe), Manganophyllite (Mn), Micaceous Iron Ore
Chemical Formula	:	Potassium iron magnesium aluminium silicate hydroxide fluoride.
Class	:	Silicates
Subclass	:	Phyllosilicates
Group	:	Micas
Environment	:	Granitic rocks. Forms a series with phlogopite. Has several Polytypes.

Color is black to brown and yellow with weathering. Luster is vitreous to pearly. Transparency crystals are transparent to translucent. Crystal System is monoclinic. Cleavage is perfect in one direction producing thin sheet or flakes. Fracture is not readily observed due to cleavage but is uneven. Streak is White, Grey. Associated Minerals are quartz, felspars, apatite, calcite, hornblende, garnets and schorl. Cleavage is perfect in one direction producing thin sheet or flakes.

Highly perfect basal cleavage. Biotite is an extremely common mica, being an important constituent with muscovite. It used for Heat insulator in industries. Biotite is iron rich. The darkar color and density increase with an increase in the iron content. Biotite, like other micas, has a layered structure of iron magnesium aluminium silicate sheets weakly bonded together by layers of potassium ions. These potassium iron layers produce the perfect cleavage. Single large plates or *books* of biotite can grow to considerable size and can make impressive mineral specimens. Weathered tiny crystals of

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biotite can appear golden yellow with a nice sparkle producing a *fool's Gold.*

Śodhana

प्रतप्तं सप्तवाराणि निक्षिप्तं कान्जिकेऽभ्रकम्। निर्दोषं जायते नूनं प्रक्षिप्तं वाऽपि गोजले।।
त्रिफलाक्वथिते चापि गवां दुग्धे विशेषतः। र. र. स. २/१६

Requirements

1. *Abhraka* - q.s.
2. Nirvāpana drava - *Any liquid among the Kāñjika, Gomūtra, Triphala Kwātha, Godugdha, Badari Kwātha, Kulutha Kwātha, Takra, Agastya Puṣpa Swarasa, Kārpas Patra Swarasa can be taken.*
3. *Palika Yantra* - 1
4. *Koṣṭi* - 1

Method : Required quantity of *Abhraka* is collected in *pālika yantra* and kept in *Koṣṭi* to heat the contents till it becomes into red hot state.The *abhraka* is dipped in any one of the above mentioned *dravadravya*, after some time it is filtered and like this same procedure is repeated for 7 times. After the 7th time *nirvāpana*, *śuddhābhraka* is collected and dried.

Dhānyābhraka Vidhi

चूर्णाभ्रं शालिसंयुक्तं वस्त्रबद्धं हि कांजिके। निर्यातं मर्दनाद्वस्त्राद्धान्याभ्रमिति कथ्यते।। र. र. स. २/२१

Requirements

1. *Śudda Abhraka* – 4 Parts
2. *Śāli dhānya* (Paddy) – 1 Part
3. Woolen Cloth / Gunni Bag Piece and thread
4. *Kāñji* – Required quanitity

Method : Required quantity of *śuddhābhraka* and *śālidhānya* are mixed together and made into *poṭṭali* form. Gunnibag pieces or woolen cloth pieces can be used for making *poṭṭali*. Then this *poṭṭali* is immersed in *Kāñji*, which is collected in the vessel. This total contents are left as it is for 1 day. After that the *poṭṭali* within the liquid repeatedly pressed with hands.

Because of this process, fine particles of *abhraka* will come out from *poṭṭali*, when most of the *abhraka* content is came out, then it is collected and dried. This collected *abhraka* is called *dhānyābhraka* and used for *abhraka bhasma* preparation.

Uses of Śodhana

Generally, the following rocky material may come as foreign material along with *Kṛṣṇābhraka*. Because *Kṛṣṇābhraka* is obtained from these rocky areas :

Greaynite	*Dayorite*	*Trakaite*	*Pegmatite*	*Sayonite*	*Desaite*
Grenodayorite	*Monjaite*	*Letaite*	*Tonelite*	*Railaite*	*Endesaite*

The following minerals also may come as foreign material along with *Kṛṣṇābhraka*.

Quartz, Felsfar, Potasium Felspar, Granite, Spinal, Plejiyoklej, Pirehotite, Starlite, Kainite, Silemnite, Endelyusaite, Kordieraite, Iiaite.

Apart from those above mentioned materials, there may be chance of presence of other minerals too in low percentage.

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Complications of Aśuddha Abhraka

1. *Vividh Pīḍautpṛdak*
2. *Kuṣṭa Kāraka*
3. *Kṣaya Kāraka*
4. *Pāṇḍu rogotpādak*
5. *Śotha Kārak*
6. *Hṛcchūla Utpādak*
7. *Pārśvapīḍadāyak*
8. *Mandagni Karak*
9. *Kṛmi Utpādak*

उमाफलं जले पिष्ट्वा सेवते यो दिनत्रयम्। अशुद्धाभ्रकदोषेण विमुक्तः सुखमेधते।। र. ज. नि.

Antidote for *Aśuddhābhraka Sevana. Atasibīja* is grinded with water and administered for three days and then complications of *asuddhabhraka* are get reduced.

Uses of śuddha abhraka

It is advised that, for the purpose of *dhānyābhraka vidhi, māraṇa* and *satvapātana*, *śudda abhraka* only to be used.

Pharmacological Properties

गौरीतेजः परममृतं वातपित्तक्षयघ्नं। प्रज्ञाबोधि प्रशमितरुजं वृष्यमायुष्यमग्यम्।।
बल्यं स्निग्धं रूचिदमकफं दीपनं शीतवीर्यम्। तत्तद्योगैः सकलगदहृद्व्योम सूतेन्द्रबन्धि।। र. र. स. २/२

Rasa	:	*Kaṣāya, Madhura*
Guṇa	:	*Snigdha*
Virya	:	*Śīta*
Vipāka	:	*Madhura*
Karma	:	*Dīpana, Balya, Prajnābodhi, Vṛṣya, Āyuṣya, Sūtendrabandhi, Rūpaprada, Śariradārḍhya, Rogaghna, Mṛtyuhara, Śariradārḍhyakara, Vīryastambhakara, Vīryavṛddhi, Pumsatwakara, Santānakara, Rasāyana, Vātapittaghna, Kaphakara, Tridoṣaghna* etc.
Doṣa karma	:	*Vātapittaghna, Kaphakara, Tridoṣaghna.*

Physico-Chemical Characters of Purified Kṛṣṇābhraka (after dhānyābhraka vidhi)

1.	Colour	Black
2.	Appearance	Soft Powder with Lusture
3.	Moisutre Content	0.269 % w/w
4.	Ash	94.54% w/w
5.	Iron Cal.as Fe	16.33% w/w

Māraṇa

धान्याभ्रं कासमर्दस्य रसेन परिमर्दितम्। पुटितं दशवारेण म्रियते नात्र संशयः।। र. र. स. २/२२
अथवा बदरीक्वाथे ध्मातमभ्रं विनिक्षिपेत्। मर्दितं पाणिना शुष्कं धान्याभ्रादतिरिच्यते।। (रसमञ्जरी ३/४१)
गन्धर्वपत्रतोयेन गुडेन सह भावितम्। अधोर्ध्वं वटपत्राणि निश्चन्द्रं त्रिपुटैः खगम्।। र. र. स. २/२६
लोहादीनां मृतानां वैशिष्टटदोषापनुत्तये। क्रियते यस्तु संस्कार अमृतीकरणं मतम्।। र. त. २/५८
धान्याभ्रकं समादाय रविक्षीर विमर्दयेत्। रविमूलद्रवैर्वापि दिनमेकं निरन्तरम्।।
ततः संज्ञोषयेद्धर्गे गगनं कृत्चकिकम। रविपत्रै च संवेष्ट्य सप्तवारं विधानतः।।

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पुटेद्गजपुटेनैव रसतन्त्रविशारदः ततो । न्यग्रोधमूलात्थैः क्वाथैर्दद्यात्पुटत्रयम् ।।
तद्रवद्रम्भारसेनापि सप्तवारं पुटेद्भिषक् । एवं स्वल्पैः पुटैरेब गगनं मृतिमाप्नुयात् ।।

(रसतरंगिणी, तरंग १०; ३९-४२)

Ingredients

1. *Dhānyābhraka* - *1 Part*
2. *Bhavaana dravya* - *Q.S*

Method-1 : The *dhānyābhraka* is ground well with the *ravikṣira* or *ravimūla rasa* or *ravi dala rasa.* With the *Ravi dala rasa* for one day *bhavana* is given, then the contents are made into thin and flat *cakrikas* are made and dried under the Sun. These *cakrikas* are kept in a *śarāva sampuṭa* and *sadhilepa* is done. There after *gajapuṭa* is given. This process is to be repeated seven times. Then the *ābhraka* is ground well in *nyagrodha mūla kwātha,* dried and *gajapuṭa* is given. This process is repeated three times. Again the *abhraka* is ground in *kadali rasa* and seven *gajapuṭas* are given separately. In the end this should be ground in *vata jaṭa* or *vatānkura kwātha* and three *gajapuṭas* are given.

Method-2 : If *Dhānyabhraka* is triturated in *Kāsamarda* juice and given *Gajpuṭa,* its *bhasma* is produced undoubtedly. Similarly *bhasma* is made available by grinding *Dhānyabhraka* in *Musta* juice or *Taṇḍulīya* juice and then, by subjecting to the *Gajapuṭas.*

Dose : 125 mg. to 375mg.

Anupāna : *Madhu, Ghṛta, Triphalakwātha, ārdraka Swarasa* etc.

Therapeutic Uses

Kṣaya, Jara, Vali, Palita, Pāṇḍu, Grahaṇī, Āmaśūla, Prameha, Aruci, Jwara, Śwāsa Kāsa, Mandāgni, Mūtrakṛchra, Unmāda, Śopha, Kāmala, Pañcavidhagulma, Udararoga, Arśa.

Abhraka Bhasma Sataputi

क्षीरत्रयं काकमाची गोक्षुरः खरमंजरी। वटप्ररोहो गोमूत्रं तुलसी कदलीषिफा।।
एभिरमं विमर्द्याथ दशवारं पृथक पृथक्। पुटेत्पुट विधानज्ञः फमेणैव भिषग्वरः।।
शतधा पुटनादेवं रक्तोत्पलसमप्रभम्। निश्चन्द्रं जायते भस्म सर्वदोषविजितम्।

(रसतरंगिणी, तरंग १०; ४३-४५)

Ingredients

1. *Abharaka* - *1 Part*
2. *Ravi Kṣīra* - *Q.S.*
3. *Vaṭa Kṣīra* - *Q.S.*
4. *Snuhi Kṣīra* - *Q.S.*
5. *Kākamachi (rasa)* - *Q.S.*
6. *Gokṣūra Kwātha* - *Q.S.*
7. *Apamārg Swarasa* - *Q.S.*
8. *Vaṭa Praroha* - *Q.S.*
9. *Gomūtra* - Q.S.
10. *Tulsi Swarasa* - *Q.S.*

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11. Kadli jala Q.S.

Type & Number of puṭas : Gajapuṭa 10-100-1000

Colour of Bhasma : Red, Yellowish red, shining brown, deep red, Lustreless.

By doing *māraṇa* to *Abhraka* its particles are made finer, its orignal chemical composition gets altered and certain new compounds are formed due to oxidation and reduction. Its *bhasma* is of brick red colour probably due to the formation of iron oxide. During *māraṇa* its lusture is destroyed completely and the final product is said to be free from any shine or lusture. The *puṭas* of *abhraka* is continued till the *abhraka bhasma* gets the colour of brick. Generally less number of *puṭas* given *Abhraka bhasma* administration produces *vānti, klama, glani, recana* etc. adverse reactions.

Dose : 125 m.g. to 375 m.g.

Anupāna : *Madhu, Ghṛta, Triphala Kwātha, Guḍūchi Swarasa, Ādraka Swarasa.*

Therapeutic Uses

Agnimāndya, Grahaṇi, Kapharoga, Śwāsa, Jwara, Raktapitta, Kāsa, Pāṇḍu, Rasāyana, Kṣāya, Jara, Vali, Palita, Amasūla, Koṣṭhamaya, Jwara, Swasa, Prameha, Aruci, Mahdagni, Mūtrakṛcra,. Bhūtaroga, Unmāda Sophamāya, Kāmala, Pancavidhagūlma, Udararoga, Arśa, Mṛtya.

Amṛti Karaṇa

To make *Abhraka bhasma* absolutely free from any adverse effects and to make it therapeutically more effective it is further processed. Ten parts of *abhraka bhasma* should be added with 15 parts of the decoction of *triphala* and eight parts of *Go-ghṛta*. All these should be boiled in an iron pan for three days till the *ghṛta* and *triphala kwātha* gets dried up and well mixed with *bhasma* of *abhraka*. This powder is useful in the treatment of diseases.

Satwapātana

पादांशटंकनोपेतं मुसलीरसमर्दितम्। रुन्ध्यात्कोष्ठ्यां दृढं ध्मातं सत्त्वरूपं भवेद्घनम्।।

र.र.स. २/२८

Abhraka mostly contains metals like iron etc. This would yield *satwa* (essence-metallic portion) of *Abhraka*.The *bhasma* of *abhraka* should be mixed with 1/4th quantity of the powder of *tankaṇa* and triturated with the juice or decoction of *musali*. This should be kept in a crucible and cooked over strong fire inflamed with the help of a blower. After about three hours of strong heat, the *satwa* or essence of mica comes out of it. This metallic *satwa* is further processed and reduced to *bhasma* form. It is also used therapeutically. This is an excellent rejuvenating agent.

Uses of Abhraka in Rasaśāstra

Abhraka Satwapātana, Abhrakadhṛti, Abhrakagras, Abhraka Cāraṇa, Abhraka Jāraṇa, Rasapakṣacched with *Abhraka, Abhrakavedh Kriya* etc. different procedures are mentioned in *Rasaśāstra*, which are related with *Abhraka*.

Formulations

Dantodbhedagadantak Ras. Nāgarjunabhra Ras, Nṛpativallabha Ras, Pancānan Ras. Piyuṣavalli Ras, Sarvatobhadra Ras, Arśakuṭhāra Ras, Garbhacintāmaṇi Ras, Candrāmsu Ras, Tārakeśwar Ras, Puṣpadhanva Ras, Pūrṇa candra Ras, Bṛhatpūrṇa Candra Ras, Bṛhatvangeśwar Ras, Bṛhat Śṛngārabhra Ras, Brahmi Vaṭi, Mahajwarankuśa Ras, Mahavātavidhwamśini Ras, Vajrakapāṭha Ras,

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Vasantatilak Ras, Śwāsakāsacintāmaṇi, Śṛngārābhra Ras, Kumārakalyāṇa Ras, Gaganasundara Ras, Caturmukha Ras, Candrakala ras, Candrāmṛta Ras, Cintāmaṇi Caturmukha Ras, Candrakala Ras, Candramṛta Ras, Cintāmaṇi Caturmukha Ras, Tarunārka Ras, Bṛhat Kastūri Bhairava Ras, Bṛhatvātacintāmaṇi Ras, Mahavatāgajankuśa Ras, Yogendra Ras, Gūḍūcyādimodaka, Jirakādimodaka, Saubhāgyaśuṇṭhi, Mahayogarājaguggulu, Prabhākara Vaṭi, Plihārivaṭika, Śivaguṭika, Śukramātruka Vaṭi, Saubhāgyavaṭi, Pancāmṛta Parpaṭi, Ratnagiri Ras, Rasarāja Ras, Lakṣmināraya ṇa Ras, Lokanātha Ras, Vasantakusumākara Ras, Vātaraktāntaka Ras, Vātavidhwamsan Ras, Śrīnṛpati Ras, Śiddaprāṇeśwara Ras, Sūtika Bharaṇa rasa , Puṭapakwa Viṣamajwarāntaka Loha, Pradarāntaka Loha, Pradarāri Loha, Yakrudāri Loha, Bālasūryodaya Ras, Bhedijvarānkuśa Ras, Naṣṭapuṣpāntaka Ras, Sannipātabhairava Ras.

VAIKRĀNTA

विकृन्तयतिलोहानि तेन वैक्रांतकः स्मृतः ।। र.र.स. २/६०

Vaikrānta cuts down the metals or produces deformity in the form of metals, hence it is called *Vaikrānta*. On heating, it shines but with further heating it gets molten. It is insoluble in water. Also in many instances, it is advised to use *Vaikrānta* in place of *Vajra*. Here an other property of it is highlighted. During the extraction of metals from their ores, ancient metallurgists used to mix *vaikrānta* in the ore, which has ability to melt, mix with the impurities of the metals and float over the molten metals from where it used to be separated. *Mahiṣāsura* the king of demons who happens to achieve all the *siddhis* (super human powers) and who happens to be born with Gods, was killed by the Goddess *Bhagavatī Durgā* with her weapon *śula* (trident). During this act whereever on the earth his blood drops have fallen, from all those places *vaikrānta,* which looked like diamond, took its origin and is considered as one of the *mahārasas*.

अष्टासृश्चाष्टफलकः षट्कोणो मसृणो गुरुः। शुद्ध मिश्रित वर्णैश्च युक्तो वैक्रान्त उच्यते।।

र. र. स. २/५३

Vaikrānta is that which has eight planes (octahedron), six angles, smooth and heavy. Available in various colours.

Śānskṛt	:	*Vaikrānta*
English Name	:	Tourmaline or Fluorspar
Hindi	:	*Vaikrānt*

Synonyms

Vikrānt, Vaikrānt, Jīrnavajraka, Kuvajraka, Cūrṇavajra and *Kṣudrakuliśa.*

Varieties

श्वेतः पीतस्तथा रक्तो नीलः पारावतप्रभः । मयूरकण्ठसदृशश्चान्यो मरकतप्रभः ।।
देहसिद्धिकरं कृष्णं पीते पीतं सिते सितम् । सर्वार्थीसिद्धिदं रक्तं तथा मरकतप्रभम् ।
शेषे द्वे निष्फले वर्ज्ये वैकान्तमिति सप्तधा ।। र.र.स. २/६१-६३

Vaikrānta is of 7 kinds, viz, white, yellow, red, blue, gray (like pigeon), Peacock neck (colour) and *Marakata maṇi* (emerald colour). The *Vaikrānta* having black colour is used in *Dehasiddhi*. They yellow variety is used in gold making, whereas white, in silver making. The red and *Marakata* coloured *Vaikrāntas* are useful in obtaining all the *siddhis*. The remaining blue and grey varieties are discarded as they are useless.

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Usefulness of each type

The black variety of *vaikrānta* may be used for achieving *dehasiddhi* (transformation of body tissue), the yellow variety is used for *pīta karma* (gold making); the white variety is used for *sita karma* (silver making), the red and green varieties are used for obtaining all types of *siddhis* (worldly objectives/super human powers). The remaining two varieties should be discarded for therapeutic uses as these are considered to be without effects. Thus, *vaikrānta* is of seven types.

Geological View

With these classically available details, *Vaikrānta* may be a gemstone, and it is claimed that it can be indentified as one of the three substances such as Tourmaline, fluorspar and Rock crystal. However there are several more crystalline stones which have such properties described under *Vaikrānta*. Anyway the above thre may be considered.

1. Tourmaline : Occurs in well developed, prismatic crystals of hexagonal system. It is available in black, brown gray, yellow, green, red, pink, blue or colourless. The black and brown varieties are generally opaque while the lighter coloured stones are transprant.

Hardness – 7 to 7.5

Sp. Gravity-3to3.2

Chemically it is quite complex. It is a borosilicate.

$Na,(Mg, Fe^{2+}, Mn, Li, Al)_3 Al_6 (Bo_3)_3 [Si_6O_{18}] (OH, F)_4, Fe^{3+}$

Occurrence : Tourmaline occurs in metamorphic rocks. Mainly found in Madagaskar, South West Africa, Shri Lanka , USA, Myanmar, Brazil and India (Bihar and Kashmir). As we can see, the Tourmaline resembles the description of *Vaikrānta* in many counts. The hardness is nearer to the *Vajra* (diamond), the colours are also numerous as said in classics. The crystalline form also indicates the same.

2. Fluorspar : It is also called fluorite or calcium fluorite .

Hardness – 4.0

Sp. Gravity –3.0 to 3.25

Chemical Formula – CaF_2

Colours : Variable, white, green, pruple , yellow, blue, also colourless.

Occurrence : It is late stage crystalline mineral in igneous rocks. Available in crystal form of cubic system. Available in Engaland, Australia, South west Africa, USA, and India (M.P. and Rajasthan).

3. Rock crystal : It is infact, the purest and most transparent variety of quartz. Generally available in colourless form; but may be found in shades of yellow, pink, red, blue, green, brown, purple and black, due to some impurities. Depending upon such colour, quartz are named as amethyst, rose quartz, smoky quartz, citrine, milky quartz, cats eye etc.

Hardness –7.0

Sp. Gravity- 2.65

Chemical Formula : SiO_2

Occureenec : Japan, Switzerland, USA, India (Tamil Nadu, Kashmir). In both the cases of Fluorspar and Rock crystal, the colours match to the colours of *Vaikrānta,* but the hardness of Fuorspar is too less to be nearer to that of diamond. The hardness of rock crystal is 7, which is similar to Tourma-

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line. As far as the tourmaline is concerned , the chemical composition is very complex, where as other two are simple, contains only calcium and fluarite in case of fluorspar and silicate and oxygen in rock crystal. With all these facts, it is difficult to identify the *Vaikrānta*, in terms of the substance available now. However generally Tourmaline is used in the name of *Vaikrānta*.

Śodhana

Vaikrānta becomes purified if it is subjected to boiling for three days in the following liquids containing *kṣāras* (alkalies) and *lavaṇas* (salts). The liquids are *amla-dravas* (acidic liquids), *mūtras* (urines), and the decoctions of *mulattha, rambhā* or *kodrava.* It is also purified by subjecting it to *svedana* (boiling) in *kulattha kvātha.*

Māraṇa

म्रियतेऽष्टपुटैर्गंधनिंबुकद्रवसंयुतैः । वैक्रांतेषु च तप्तेषु हयमूत्रं विनिक्षिपेत् ।
पौनः पुण्येन वा कुर्याद् द्रवं दत्वा पुटं त्वनुः। भस्मीभूतं तु वैक्रांतं वज्रस्थाने नियोजयेत् ।। र.र.स. २/६७-६८

Vaikrānta, after purification, is added with equal quantity of purified sulphur and rubbed in lime juice and subjected to 8 *Gajapuṭas* to convert it into *bhasma*. It can also be calcined, if *Vaikrānta* is heated intensively and immersed several times, in horse urine and rubbed in horse urine alone and given *puṭas* until it turns into to *bhasma*. This *Vaikrānta bhasma* is used in place of diamond *bhasma*.

Test

A good quality *Vaikrānta bhasma* is pinkish white in colour, soft, tasteless and odourless.

Satwapātana

मोच मोस्टपालाशक्षार गोमूत्रभावितम् । वज्रकन्द निशाकल्क फलचूर्ण समन्वितम् ।।
तत्कल्कं टंकणं लाक्षाचूर्णं वैक्रांत सम्भवम् । नरसार समायुक्तं मेषशृंगीद्रवान्वितम् ।।
पिण्डितं मूक मूषस्थं ध्यापितं च हठाग्निता । तत्रैव पतते सत्वं वैक्रान्तस्य न संशयः ।।
सत्वपातनयोगेन मर्दितश्च वटीकृतः । मूषास्थो घटिकाध्मातो वैक्रांतः सत्वमुत्सृजेत् ।। र.र.स. २/६९-७२

The *Kṣaras* (alkalies) of *Mocharasa*, *Moraṭa* and *Palaśa* are dissolved in cows urine and *bhavana* of this solvent (either individual solvent or mixture of these together) is given to *Vaikrānta* powder. Then the bolus of *Vajrābhraka* and *Haridra* and Powders of *Triphala*, *Tankaṇa* (borax), *Lākṣa* and *Navasādara* (Ammonium chloride) are added to it and rubbed in *Meṣaśṛngi* juice to prepare a ball. This ball, after drying, is kept in *Andhamūṣa* (closed crucible) and heated in intense fire. This will undoubtedly yield the *Satwa* of *Vaikrānta*. With the drugs used in *Satwapātana* (like Jaggery, *Guggulu* etc), the *Vaikrānta* is ground, a ball is made and heated intensively in a crucible for one hour, to obtain the *Satwa* of *Vaikrānta*.

Pharmacological properties

आयुष्प्रदश्च बलवर्णकरोऽतिवृष्यः प्रज्ञाप्रदः सकलदोषगदापहारी ।
दीप्ताग्निकृत्पविसमानगुणस्तरस्वी वैक्रान्तकः खलु वपुर्बललोहकारी ।।
रसायनेषु सर्वेषु पूर्वगण्यः प्रतापवान् । वज्रस्थाने नियोक्तव्यो वैक्रान्तः सर्वेदोषहा ।।
वैक्रान्तो वज्रसदृशो देहलोहकरो मतः । विषघ्नो रसराजश्च ज्वरकुष्ठक्षयप्रणुत् ।

र. र. स. २/५५,५७

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Rasa	:	*Ṣad-rasa* (Possesses all the six rasas),
Guṇa	:	Guru
Vīrya	:	Sīta
Vipāka	:	*Madhura*
Karma	:	*Āyuhprada, Balavarṇakara, Sakalabandhakara, Ativṛṣya, Prajāprada, Diptāgnikara, Pavisamāna Guna, Taraswī, Lohakārī, Rasāyana* of high potency, *Prāṇaprada, Vegaprada, Vīryakartā, Pṛajāvarṇakara, Rasabandhakara, Dehadārḍhyakara Dehakara, Viṣaghna, Rasarāja.*
Effect on Doṣa	:	*Tridoṣaghna, Sakaladoṣahara.*

Therapeutic uses

Sakalaroga, Pāndu, Jwara, Swāsa, Kāsa, Yakṣmā, Prameha, Arśa Duṣṭa grahanī, Urahkṣata, Udararoga, Viṣavikāra, Kuṣṭha and *Kṣaya.*

Dose : 5 to 10 mg.

MĀKṢĪKA

According to ancient concept *swarṇa mākṣika* is claimed to get its origin from *swarṇa śaila* (Sumeru Parvata). It was also said to be obtained from *Tāpī* river, *Kirāta, Cina,* and *yavana deśa* (Muslim countries). The mineral which is obtained from *Tāpī* river should be collected in *vaisākha māsa* (about April) when the river water gets dried due to intense sun heat. The mythological origin of *mākṣika* is described to be related to *Lord Viṣṇu* who allowed the yellowish exudate of *Swarṇa Śaila* to be collected in *Tāpī* river, *Kirāta, Cīna* and *Yavana deśa.* This,, when dried due to intense sun heat in *Vaiśākha māsa,* used to be called *tāpya or mākṣika.* Fracture-Conchoidal, the mineral is brittle, lustre-very brilliant & metallic; colour-brassy yellow, streak-Greenish or brownish black. Good conductor of electricity and strongly thermo-electric. It burns with a characteristic blue flame. The globule remaining after heating is Magnetic. The mineral is dissolved if treated with Nitric acid. 'Pyrite' in some of its forms resembles gold so closely that it is often known as fools' gold. *Chalcopyrite* is scratched readily with a knife blade or a foil while pyrite resists both as pyrite contains no copper.

Śānskṛt	:	*Mākṣīka*
English Name	:	Pyrites
Hindi	:	*Sonamakhi, Rūpamākhi*
Chemical Formula	:	$Cu\ FeS_2$
Hardness	:	6-6.6
Sp. Gra.	:	5

Synonyms

Apīta, Avarta, Garuḍa, Dhatvakṣayam, Hemamakshika, Hemadyuti, Kāmsya Mākṣīka, Kṣoudra Dhātu, Madhu Dhātu, Madhu Mākṣīka, Mākṣīka Dhātu, Nadīyam, Pītak Mākṣīka , Pītak, Pītam, Rajata Mākṣīka, Raupya Mākṣīka, Suvarṇa Mākṣīka , Swarṇahwa, Swarṇa Mākṣīka , Śwetā Mākṣīka , Tapī, Tapī Samudbhava, Tapija, Tapya, Mādhava Dhātu Prakaśa, Mādhava Mākṣīka, Tapyak, Tapyuttha Sangyaka, Tara Mākṣīka.

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Varieties

Mākṣīka may be divided into following categories on basis of its appearance and colour.

1. As per Appearance:
   (i) Golden appearance (*Swarṇa Mākṣīka*)
   (ii) Silver appearance (*Rajat Mākṣīka*)
   (iii) Bronze appearance (*Kānsaya Mākṣīka*)
2. As per Colours:
   (i) *Pīta* (Yellowish) *Suvarṇa Mākṣīka*
   (ii) *Śukla* (Whitish) *Raupya Mākṣīka*
   (iii) *Rakta* (Deep brown) *Kānsya Mākṣīka*

It is also mentioned that, two main varieties based on colour, *i.e., suvarṇa mākṣika* and *tāra mākṣika.* Of these, the former is better in properties than the later variety. The *suvarṇa mākṣika* is called chalcopyrite which is a (mixture) compound of copper, iron and sulphur and is still considered the main ore (source) of copper. It contains 30-34% copper. It is a soft, brittle, uneven and golden coloured mineral which if rubbed on palm may produce blackness on it. In *Āyurveda Prakāśa* it is claimed to be the *upadhātu* of gold and to possess some gold like properties, hence advised to be used in place of gold, though in reality it does not contain gold even in traces. Further mentions that it contains not only the gold properties but possesses many other properties also because of the presence of other elements in it. On heating it starts burning due to the presence of sulphur and given rise to SO_2.

The *tāra mākṣika* is golden white, does not contain copper, but contains only iron and sulphur. Because of its inferiority to *suvarṇa māksika* its pharmaceutical processings and pharmacotherapeutic properties and uses are not found described.

Availability

According to the ancient texts it is said to be procured from *'Kanyakubja'*, *Taptitira* (Banks of *Tapti* river), *Kirat, China* and *Yavana deśa.* It is also excavated mainly from land of Japan, Spain, U.S.A., Portugal, Italy, Norway and Cyprus. At present in India, *Ghatshila* in Bihar and *Khetadi* in Rajasthan are the big copper projects of Government of India, where copper metal is extracted from *Swarṇa Mākṣīka.*

Market Trend

Now a days in market the real chalcopyrite is usually replaced by iron pyrite (*tāra mākṣika*) hence only the *tāra mākṣika* is being used as *māksika* which is not proper.

Acceptable Variety

Mākṣīka are described to be *Niskonas* (having no angles), *Guru* (heavy), *Suvarṇa Varna* (bright golden colour with slight bluish ting) and *Snigdha* (oily). *Mākṣīka* when it rubbed on *Nikaṣa* produce golden lining, but when it rubbed on hand it produce blackish colour over the hand. On breaking its surface, seems to be of golden colour, soft, brittle and could be cut with a knife. Extraction through intense heating yield *Satva* which is similar to copper in various properties. Such sample of *Mākṣīka* are considered best for all purpose.

It is concluded in several texts that *Rajata Mākṣīka* posses silver like properties but actually it is very inferior inferior to silver in its virtues. However, when it rubbed on *nikaṣa* its linings resembles

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silver. It is heavy and smooth. It contains more stony portion hence it yields less *Satva* and considered inferior for all purposes.

Śodhana

एरण्डतैललुङ्गाम्बुसिद्धं शुद्ध्यति माक्षिकम् । सिद्धं वा कदलीकन्दतोयेन घटिकाद्वयम् ।।
तत्पं क्षिप्तं वराक्वाथे शुद्धिमायाति माक्षिकम् । र. र. स. २/८३

Mākṣīka is powdered and boiled for two hours in *Eraṇḍa Taila* and juice of *Mātulunga*. By the process it is purified or it becomes pure even by boiling in *Kadali Kanda* juice for two hours. It can also be purified by heating in intense fire and dipping in *Triphala* decoction for seven times.

Māraṇa

ताप्यं निम्ब्वम्लसंपर्क्व पुनर्निम्बूकवारिणा। सम्पेष्य सम्पुटस्थन्तु पुटयेत कृतचक्रिकम् ।।
एवं दशपुटैरेव पंचतामेति माक्षिकम्। रक्तोत्पलदलच्छायं जायते चातिशोभनम् ।।
(रसतरंगिणी, तरंग २१/२०)

मातुलुङ्गाम्बुगन्धाभ्यां पिष्टं मूषोदरे स्थितम्। पंचक्रोडपुटैर्धग्धं म्रियते माक्षिकं खलु ।। (र.र.स.२/८४)

For *Māraṇa* it should be triturated with lemon juice and heated by *puṭa* system using five *varāha puṭas*. The colour of its *bhasma* should be like that of *dhātu/gairika* (red ochre). As it contains copper, care should be taken while preparing its *bhasma* to make it free from the bad/toxic effects of copper. Total materials and method required for *Māraṇa* of *Mākṣīka* is mentioned below :

1. *Māraṇa* drugs	*Hingula, Gandhaka, Kharpar, Kajjali.*
2. *Bhāvana* drugs	*Gomūtra, Kulthi, Takra, Nimbu swarasa, Ghṛta kumāri and Eraṇḍa Sneha, Mātulunga Eraṇḍa taila, Ajāmūtra, Devadāli, Hansapadi, Bala, Arba, Sneha.*
3. Apparatus	*Sharava samputa, Lauha Darvi, Khalva Yantra.*
4. Process involved	*Mardan*. Preparation of *Chakrika*, *Kupipaka*.
5. Type of *Puṭa*	*Varāha puṭa, Gaja puṭa, Bhudhar puṭa.*
6. Number of *Puṭa*	Three, five, seven, eight, ten
7. Type of fuel	*Vanyopala*
8. Colour of *Bhasma*	*Sindūra, Rakta Kamala, Rakta Varṇa, Dhātusannibham.*

Apart from the above mentioned colour, *Mākṣīka bhasma* should also posses the common characteristic of *bhasma*, such as *Nischandratva*, *Sūkṣmatva Vāritaratva* and *Gatarasatva*. The last one is most peculier for *Mākṣīka bhasma*.

Satwapātana

For extracting metallic content it should be mixed with 1/4 part borax and triturated with lemon juice and then subjected to strong heating upto 1200°C. Its *satva* is very much similar to copper in colour and appearance. After removing the separated copper as *satva*, one many collect iron also from the slag.

Pharmacological Properties

माक्षीकधातुः सकलामयघ्नः प्राणो रसेन्द्रस्य परं हि वृष्यः । दुर्मैललोहद्वयमेलनश्च गुणोत्तरः सर्वरसायनाग्र्यः ।।
र. र. स. २/९३

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माक्षिकं तिक्तमधुरं मेहार्शः क्रिमिकुष्ठनुत् । कफपित्तहरं बल्यं योगवाहि रसायनम् ।। (रसेन्द्र चि. ७/१०८)
सुवर्णमाक्षिकं स्वादु तिक्तं बृष्यं रसायनम् । चक्षुष्यं बस्तिहृत्कण्ठपाण्डुमेहविषोदरम् ।।
अर्शः शोफं विषं कण्डूं त्रिदोषमपि नाशयेत् ।। (आयु. प्र. ४/१०)
जीर्णज्वरमपस्मारं मन्दानलमरोचकम् । अनिद्रां नाशयत्याशु योगवाहि परं मतम् ।। (रसतरं. २१/२८)

Rasa : *Tikta, Madhur*
Guṇa : *Śīta, Laghu*
Vīrya : *Śīta*
Vipāka : *Kaṭu*
Karma : *Balya, Yogavāhi, Rasāyana, Prāṇavardhaka, Vṛṣya, Cakṣusya, Sakalāmayaghnah, Rasendrapurana, Gunottara, Durmala.*
Doṣa Prabhāva : *Tridoṣaghna, Kaphapittahara.*

Dose : 120 - 240 mg
Anupāna : *Madhu*

Therapeutic Uses

Kṣaya, Pāṇḍu, Prameha, Kuṣṭha, Grahaṇi, Arśa, Kṛmi, Viṣa, Udara, Śotha, Kaṇḍu, Mandāgni, Kāmala, Śoṣa, Swarabhanga, Āmadoṣa, Visūcika, Nanarupajwara, Vastiruja, Jirnajwara, Apasmāra, Arocaka, Anidra, Sarvavyādhivināśana.

VIMALA

Vimal is in a form of pale yellowish cubic pieces, unctuous looking, with multiple surfaces and angels. Its yellow colour resembles to that of brass. Chemically it is not much different from *tārāmākṣika*. However, its form and appearance are very peculiar, i.e., it is cubic, brilliant and associated with angles and facets. In India it is available in abundance. Its chemical name is 'cubic sulphide of iron' which does not contain copper even in traces. Cubic sulphide of iron (*vimal*) is more hard and heavy than Chalcopyrite. On intense heating, sulphur burns out from *Vimala*. When scratched on grindstone it creates blackish white lines. Crystals are common often large; the common forms are the Cubes, Octahedrons and Pyritohedron. Also massive and disseminated. Fracture–Uneven. Lustre-metallic or opaque. Mineral is brittle, colour–Pale brassy to golden yellow; sometimes with brown or variegated turnish colour. Streak-Greenish to brownish black. Composition : Fe 46.6%, S-53.4% it may contain cobalt, nickel, copper, arsenicand gold in varying amounts. Decomposes readily specially in moist atmosphere. Pyrite is more stable than Marcasite, the arthorhombic modification of Fe S_2. Pyrite is the most common Sulphide mineral and hence is found very widely distributed. It occurs in rocks of all ages, usually associated with other sulphides such as Galana, Chalcopyrite, Sphelerite and Arsenopyrite. Commonly found in quartz with native gold.

Śānskṛt : *Vimala*
English Name : Iron Pyrite
Hindi : *Vimal*
Chemical Formula : FeS_2
Hardness : 6-6.5
Sp Gr. : 5-5.2;

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Varieties

On the basis of its shining *Vimala* is of three types i.e. 1. *Swarṇa Vimala* – Which is golden in colour, 2. Roupya Vimala- Whitish in colour, 3. Kāmsya vimala and are associated with *aśra* (edges) and *phalaka* (Facetes).

विमलास्त्रिविधः प्रोक्तो हेमाद्यस्तारपूर्वकः । तृतीयः कांस्यविमलस्तत्तत्कान्त्या स लक्ष्यते ।।
वर्तुलः कोनसंयुक्तः स्निग्धश्च फलकान्वितः । मरुत् पित्तहरो वृष्यो विमलोऽतिरसायनः ।।
पूर्वो हेमक्रियासूक्तो द्वितीयो रूप्यकृन्मतः । तृतीयो भेषजे तेषु पूर्वपूर्वो गुणोत्तरः ।।

र.र.स. २/९५-९७

Vimala is of three varieties, viz. *Hema vimala* (*Swarṇa vimala*), *Tara vimala* (*Ṛoupya vimala*) and *Kamsya vimala*. These *Vimalas* shine like gold, silver and bronze.

Availability

In India, it is found in Bihar, Orissa, West bengal, Tamilnadu, Kashmir, Madhya Pradesh and Karnataka, According to *Āyurvedic* texts, *Vimala* is found near the sources of silver and lime.

Acceptable variety

Vimala, which is heavy, shiny and is hexagonal or octagonal in shape, is supposed to be the best variety for medicinal usage.

Śodhana

आटरूषजले स्विन्नो विमलो विमलं भवेत् । जम्बीरस्वरसे स्विन्नो मेषशृंगीरसेऽथवा ।
आयाति शुद्धिं विमलो धातवश्चयथाऽपरे ।। र. र. स. २/९८-९९

If *Vimala* is boiled in *Vāsa* juice or decoction, with the help of *Dolā Yantra,* it becomes pure. Similarly it can also be purified by doing *Śwedana* (boiling) in lemon juice or *Meṣaśṛngi* juice.

Māraṇa

गन्धाश्मलकुचाम्लैश्च म्रियते दशभिः पुटैः । (र.र.स. २/१००)

Purified *Vimala* is powdered and equal quantity of pure sulphur is added. This mixture is processed *(bhāvana)* with the juice of *Lakucha* fruit and then subjected to *Puṭa*. This procedure is repeated for ten times to incinerate *Vimala*. Finally all sulphur gets burnt out and the *bhasma* is produced. *Vimal bhasma* is brownish red in colour.

Satwapātana

सटङ्कलकुचद्रावैर्मेषभृङ्ग्याश्च भस्मना । पिष्टो मूषोदरे लिप्तः संशोष्य च निरुध्य च ।।
षट्प्रस्थकोकिलैर्ध्मातो विमलः सीससन्निभः । सत्त्वं मुञ्चति तद्युक्तो रसः स्यात् स रसायनः ।।

(र.र.स. २/१०१-२)

The *bhasma* of *Vimala* is mixed with borax and *bhasma* of *Meṣaśṛngi* (Gymnema sylvestrei) and processed with the juice of *Lakucha* fruit. The paste of this mixture is applied on the inner surface of a crucible and after it is dried, the crucible is properly sealed and subjected to heating with the coal fire. Finally, *Vimala satva* gets ready. It looks likes lead. When it is mixed with mercury, it works as a rejuvenative.

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Pharmacological Properties

Guṇa	:	*Snigdha, Guru*
Effect on Doṣa	:	*Vāta and Pitta Hara*
Karma	:	*Vṛṣya,Rasāyana*

Dose : 60 to 120 mg.

Anupāna : Milk, *Sugar, Trikaṭu, Triphala* mixed with ghee.

Therapeutic uses

Twak doṣa, vraṇa, destroys dhātugata jwara, śotha , pāṇḍu, prameha, aruci, arśa, grahaṇi, severe śūla, yakṣma, kāmala and all the diseases caused by *vāta* and *pitta doṣa.*

ŚILAJIT

Śilajit is an exudation from rock during hot sunny days. Though it may be occurring in many parts of the world but India was the first to highlight its tremendous therapeutic value for many centuries (era of *Caraka & Suśruta*). *Āyurveda* mentions it as wonderful medicine. It describes that *śodhita śilajit* after *bhāvana* can cure even the *asādhya* diseases and disorders. The *śilajit* has been in extensive use in the preparations of a number of medicines. In *purāṇic* period the author of *Bṛhat Rasarāja Sundara* mentions about *śilajit*, as quoted in *Purāṇas*, where the *śilajit* is mentioned as mineral ore substance of *Mandāracala Parvata*. During the time of *Samudra Manthana Mandāracala* and *Vāsuki Nāga* were used for churning purpose by Gods and Demons. Due to friction some minerals were produced in *Mandāracala Parvata*, among these *śilajit* was one. In *Rasārṇava* the origin of *Śilajit* is mentioned in seventh *paṭala*. Here *Lord Śiva* narrated about the process of origin of the drug as during summer season the mountain gets heated up and as a result these mountains releases the extract of the exudate of *Dhātu* called as *Śilajit*. In *Rasa Ratna Samucchaya*, *Basavarājeeyam*, *Rasa Paddhati* etc. there is description regarding the origin of *Śilajit*, which are almost similar to each other with minor difference. Regarding the origin and description of *Śilajit* the authors which followed the concept of *Caraka* were *Cakradutta*, *Rasendra Chintāmaṇi*, *Rasajalanidhi* etc. The texts which followed *Suśruta* concept were *Śārangadhara*, *Bhāva Prakāśa*, *Rasāmṛta* etc. *Āyurveda Prakāśa*, *Rasendra Puraṇa*, *Yoga Ratnakara* etc. followed the idea of *Rasārṇava*. According to above reference, at the time of *Samudra manthana* by the Gods and Demons, due to friction, heat was generated and as a result great amount of sweat was formed. The sweat mixed with the nectar thought to be divine by the gods. That divine drug was distributed in little quantities to the mountains, the same thing melted due to the sunrays and became *Lac* or *Jatu* like and hence the *Śilajit* got the name. All the *Āyurveda* lexicons believed the later part of formation of *Śilajit* the origin from the mountain due to the intense sun heat.

Śānskṛt	:	*Śilajit*
English Name	:	Mineral Pitch
Hindi	:	*Śilajit*

Synonyms

Adreyam, Atithi, Cakram, Adrija, Girih, Śaileyam, Adreyam, Girija, Śaila, Aśmajam, Gaireya Śilodbhava, Aśmotham, Śila, Dhātu, Śilābhyam, Dhātujam, Jatu, Śilajatu, Jatvaṣmaka, Śilāniryāsa, Adrijatu, Śilāsveda, Aśmajatu, Śilamahe, Aśmajatukam, Śilavyādhi, Girijatu, Śiladhātu, Śailadhātu, Śailottha, Dhātuja, Uṣṇaja.

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Availability

Śilajit is a product exuding out of rocks in the *Himalayan* area in summer months due to the heat of strong sun. Basically the origin of *Śilajit* is described in *Caraka Cikitsa Sthāna*. It is mentioned that when the mountain rocks, which are abundant in metallic elements like gold, silver, copper and iron are heated up then the Lac like exudate, which is soft like clay oozes out. In *Suśruta* the reference of origin is found similar to that of *Caraka* but specifying the season as *Jyeṣṭha* and *Āṣāḍha*. *Śilājatu* is seen oozing out of the lime stones in the mountains near *Sarayu* and *Ramaganga* in *Kumayan* district of Uttar Pradesh. It is said to be available also at *Gangotri* and *Yamunotri*.

Varieties

Different types of *Śilajit* are mentioned in various contexts as far as number is concerned, but the basic concept remains same ie. variety depends upon the rock from where it exudes. Most of the authors believed that there are only four varieties of *Śilajit* following the concept of *Caraka*.

1. *Swarṇa* (Gold), 2. *Rajata* (Silver), 3. *Tāmra* (Copper), 4. *Loha* (Iron).

This classification is based not only on the colour and consistency of *Śilajit* but also on the element present in the mountain from which *Śilajit* emerges. According to *Suśruta*, *Śilajit* is of six types.

1. *Swarṇa*, 2. *Rajata*, 3. *Tāmra*, 4. *Lauha*, 5. *Nāga*, 6. *Vanga*

The author of *Aṣṭānga Hṛdaya* also followed *Suśruta's* classification. *Rasa Ratna Samucchaya* described 3 types of *Śilajit* not mentioning about *lohaja* variety.

In another classification of *Śilajit*, the same author has divided it in to two groups.

1. *Gomūtra Gandhi* 2. *Karpūra Gandhi*.

Gomūtra Gandhi is again subdivided into two as

i. *Sasatva*, ii. *Nihsatva*

In commentary of *Rasendra Sāra Sangraha*, *Śilajit* was divided in to two types.

a. *Girija*, b. *Uṣaraka*.

Girija is again divided into 6 types based on the presence of metal in it.

1. *Kāncana*, 2. *Rajata*, 3. *Tāmra*, 4. *Lauha*, 5. *Vanga*, 6. *Yaśada*

Uṣaraka is again divided into two types

1. *Kṣāra* or White coloured., 2. Red coloured like fire.

Śilajit have been mentioned as of two types in *Rasārṇava*.

The author of *Ānand Kanda* considered *Śilajit* to be of two types as that of *Rasa Ratna Samucchaya*, but in this text the *Karpūra gandhi* was divided in to *Sasatva* and *Nihsatva*. The author of *Āyurveda Prākaśa*, *Rasapaddhati* mentioned two variety of *Śilajit*.

Śilajit is placed in the different groups according to various texts : *Maharasa*, *Uparasa*, *Dhātu Varga*, *Dhātvadi Varga*, *Dhātupadhātu Varga*, *Suvarṇādi Varga*, *Candanādi Varga*, *Uṣakādi Gaṇa*.

Śodhana

In *Vidhyotani Tika* the purification of *Śilajit* is stated. *Vāgbhaṭṭa* followed the concept of *Caraka*. *Suśruta* mentioned about the purification method with *Sālasaradi Gaṇa drugs*.

In *Rasārṇava* the purification is stated, as drug should be boiled with *kṣāra*, *āmla varga*, *gomūtra*

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or with *ghṛta*. Purification can also be done in two types by *ārdraka swarasa*, but the exact procedure is not mentioned. In *Rasendra Sāra Sangraha* and *Rasa Ratna Samucchaya* the purification method is similarly mentioned ie. mixing the drug in cows milk, *triphala* decoction and expressed juice of *Eclipta alba* in an iron container successively for one day each with the above mentioned drug. *Āyurveda Prakāśa* also followed the same procedure with little difference. *Sūrya tapi* method of purification has also been mentioned in *Rasa Ratna Samucchaya* and *Āyurveda Prakāśa*. In *Āyurveda Prakāśa* the purification of the *Śilajit* is dealt in detail. Firstly for the external impurities, the drug has to be washed with plain water and to remove the internal impurities it should be triturated with the decoction of *Neem*, *Guḍūci* and *Indrayava* specially in the container made up of iron for 7 times with each drug. In *Rasa Taraṅgiṇi* the author has described purification process of *Śilajit* in detail, which includes not only the condition in which it is purified but also the technique to extract *Śilajit* as per *Sūryatāpi* method, where the solvents used are hot water and *Triphala* decoction. The author of *Rasendra Cūḍāmaṇi* described about the purification process of *Śilajit* in one *śloka*. *Śwedana* should be performed in *śwedna yantra* to that *Śilajit* which is already triturated with *kṣara*, *āmla* and guggulu for one hour. *Basavarājiyam* followed the concept of purification as above. *Ancient Rasācaryas* have also described the *śodhana* of *karpūra Śilajit* by trituration with the decoction of Cardamom and drying.

Test

The tests mentioned in *Āyurvedic* texts are only of a crude type. Genuinety of any drug is justified by the testing it as per the specification. In *Saṁhitās* and *Rasārṇava* there is no specific description about the test of *Śilajīt*. *Rsendra Sāra Samgraha, Rasa Taraṅgiṇi, Rasendra Cuḍāmaṇi, Basavarajīyam, Rasa Paddati* etc. mentioned the testing techniques which are following:

1. *Śilajīt* is put on fire it erects perpendicularly and burn with out smoke.
2. If pure *Śilajīt* is put in water through the tip of a thin erect glass it will come down slowly after spreading like fibre.
3. The pure *Śilajīt* should contain the smell of cow urine

Satvapātana

Satvapātana is a process by which the essence of the drug is obtained by subjecting it to high temperatures so that the mineral content of the drug is left behind leaving other material. *Śilajīt* is of very soft nature and hence most of the *Rasaśāstra* text doesn't prefer to subject it for the *satvapātana* process. Though *Rasārṇava* has not mentioned about *māraṇa* but it has stated regarding the *satvapātana*. According to this text *Śilajīt* is mixed with *dhānyāmla*, *upaviṣa* and *viṣa* and *satvapātana* should be performed. Authors of RRS, AP (4/133), RChu (10/107), RP (45) are in favour of *satvapātana* by triturating *Śilajīt* with *dravakagaṇa* and *āmlavarga* and putting this mixture in to the *mūṣa* and subjecting to high temperature. The *satva* obtained will be like iron. *Rasa Ratna Samucchaya* and *Rasendra Cūḍamaṇi* clearly indicated that *satvapatana saṁskara* should not be performed for *Karpūra Śilajīt*. *Rasa, Guṇa, Vīrya, Vipāka, Karma* can be considered as the properties of the drug.

The texts like *Rasa Ratna Samucchaya* believed that *Śilajīt* possess all the properties of *rasa*, *uprasa*, *pārada*, *ratna* and *lauha* together in itself.

Colour : All the texts believed that the colour of *Swarṇa Śilajīt* is red like *Japāpuṣpa*. *Rajata Śilajīt* having pale colour or white (*pāṇḍu varṇa*). *Tāmra* variety possessing blue colour and *lohaja* type is of black colour like *Guggulu*.

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Rasa : Majority of texts believe the *rasa* of *Swarṇa Śilajīt* as *Madhura* and *Tikta*. Maximum authors considered *Rajata Śilajīt* and *Tāmra Śilajīt* possessing *kaṭu* and *Tikta rasa* respectively. Majority of authors opines that *loha Śilajīt* possess *Tikta* and *lavaṇa rasa* where as *Aṣṭāṅga Hṛdaya* believe it to be of *kaṭu rasa*. *Nāga Śilajīt* possesses *Tikta rasa*. *Vaṅga Śilajīt* is having *kaṭu rasa* and *Tikta rasa*.

Guṇas of different varieties of Śilajīt

Swarṇa Śilajīt - Śīta Guṇa, Loha Śilajīt - Śīta Guṇa

Rajata Śilajīt - Śīta Guṇa, Nāga *Śilajīt - Uṣṇa, Mṇḍu Guṇa*

Tāmra Śilajīt - Uṣṇa Guṇa, Vaṅga Śilajīt - Sandhra Guṇa

The *samanya guṇa* of *Śilajīt* is considered to be Śīta by *Rasa Paddhati* & *Āyurveda Prākaśa*, where as *Caraka* and *Rasa Ratna Mala* mentions it to be of *Natiuṣṇa-Sīta*.

Pharmacological Properties

न सोऽस्ति रोगो भुवि साध्यरूपः शिलाह्वयं यन्न जयेत् प्रसह्य ।
तत्कालयोगैर्विधिभिः प्रयुक्तं स्वस्थस्य चोर्जां विपुलां ददाति ।। च. सं. चि. १/३.६४

न सोऽस्ति रोगो यं चापि निहन्यान्न शिलाजतु । सु. चि. १३/१६

रसोपरससूतेन्द्ररत्नलोहेषु ये गुणाः । वसन्ति ते शिलाधातौ जरामृत्युजिगीषया ।।
र. र. स. २/११६

जराव्याधिप्रशमनं देहदार्ढ्यकरं परम् । मेधास्मृतिकरं बल्यं क्षीराशी तत्प्रयोजयेत् ।।
च. सं. चि. १/३१.९

नूनं सज्वरपाण्डुशोफशमनं मेहाग्निमान्द्यापहं मेदश्छेदकरं च यक्ष्मशमनं शूलामयोन्मूलनम् ।
गुल्मप्लीहविनाशनं जठरहृच्छूलघ्नमामापहं सर्वत्वग्गदनाशनं किमपरं देहे च लोहे हितम् ।।
र. र. स. २/११५

Virya : All the authors considered *Swarṇa Śilajīt*, *Rajata Śilajīt* and *Lauah Śilajīt* to be of *Śīta Virya*. But exception in the case of *Bṛhat Rasa Raja Sundara*, who considers *Rajata Śilajīt* as *Uṣṇa Virya*. *Tāmra*, *Nāga* and *Vaṅga* variety of *Śilajīt* is believed to have *Śīta Virya*. Samanya *Śilajīt* is considered as *Natiuṣṇa-Śīta* by *Caraka*, AH, RRM, RT where as the *Virya* of *Samanya Śilajīt* as *Uṣṇa*.

Karma : The action of the drug is the characteristic feature of that drug. Authors believed the *Karma* of different varieties of *Śilajīt* as follows.

Swarṇa Śilajīt	-	*Rasāyana Karma.*
Rajata Śilajīt	-	*Pāṇḍuroga Naṣaka*
Tāmra Śilajīt	-	*Lekhana.*
Loha Śilajīt	-	*Rasāyana, Vriṣya*

Specific Action of Śilajīt

It has following specific actions which are given below:

Chedana karma, Vriṣya, Balya, Lekhana, Yogavahi, Rasāyana.

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Therapeutic uses

It is powerful tonic and alternative useful in a variety of diseases. In sexual weakness it is generally administered with *Aśvagandha* Dr. H.C. Sen concludes that *Śilajīt* should be tried extensively in Obesity, Diabetes, Dyspepsia, Anasarca, Enlargements of liver and spleen, Bleeding piles, Asthma etc. Many *Āyurvedic* and modern literature are available regarding *Śilajīt*.

Dose

द्विगुन्जातः समारभ्य वसुगुन्जमितं परम्। शिलामयं प्रयुन्जीत बलकालाद्यपेक्षया।।

र.त. २२/८७

पलमर्द्धपलं कर्षो मात्रा तस्य त्रिधा मता। च. सं. चि. १/३-५४

पयांसि तक्राणि रसाः सयूषास्तोयं समूत्रा विविधाः कषायाः।

आलोडनार्थं गिरिजस्य शस्तास्ते ते प्रयोज्याः प्रसमीक्ष्य कार्यम्।। च. सं. चि. १/३.२७

Action on Doṣas

Swarṇa Śilajīt	*Vata Pitta Śamaka*
Rajata Śilajīt	*Kapha Pitta Śamaka [exception Kapha Vata Śamaka, pittaśamaka, pittavataśamaka].*
Tāmra Śilajīt	*Kapha Śamaka*
Lauha Śilajīt	*Tridoṣghṇa.*
Sadharana Śilajīt	*Kaphahara, Vatahara*

Formulations

Agnimukha lauha, Arogyavardhani Vaṭi, Kuṣṭhakuṭāra Ras, Chandraprabha Vaṭi, Tāpyadi Vaṭi, Triphala Modak, Pūrṇacandra Ras, Bhīmaparākrama Ras, Mahavidya Vaṭi, Meghanāda Ras, Mehavadha Ras, Yakṣmāri Luha, Yogarāja Ras, Rasendra Vaṭi, Lankeswara Ras, Śiljatvādi Lauha, Śiljatvādi Vaṭi, Śiva Guṭika, Suddha Silajatu Prayog, Sarvamehāntak Ras.

Śilajitwādi Loha

शिलाजतुमधुज्योषताप्यलौहरजांसि च। क्षीरेण लोहितस्याशु क्षयः क्षयमवाप्नुयात्।।

(भै. र. राजयक्ष्मा चिकित्सा प्रकरणम् १४/८६)

Ingredients

1. *Śuddha Śilajit*	-	*90 gm*
2. *Yaṣṭimadhu*	-	*90 gm*
3. *Śuṇṭhi*	-	*90 gm*
4. *Marīca*	-	*90 gm*
5. *Pippali*	-	*90 gm*
6. *Swarṇamākṣika bhasma*	-	*90 gm*
7. *Loha bhasma*	-	*540 gm*

Dose : 1-2 Ratti

Anupāna : *Madhu, Dugdha.*

Therapeutic Uses

Pāṇḍu.

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SASYAKA

Mythologically, *sasyaka* is claimed to be the solidified vomitted material of *Garuḍa* (a mythical bird) containing the properties of *viṣa* and *amṛta* both, as it is claimed to be vomitted by *Garuḍa* on *Marakata (Nilagiri)* hill, after drinking *amṛta and halāhala viṣa* successively. It looks like peacock's neck and is very heavy in weight. On the basis of the above description it is diffcult to identify it properly. However, on account of its similarity with peacock's neck, similarity of its properties to *viṣa* and *amṛta*, and its heaviness, it can be identified as a copper ore. This is further confirmed by the colour of its *satva* which is mentioned to be reddish, like an *Indragopa.* In the second method it is clearly mentioned that its *satva* is *tāmrarūpa* (similar to copper). Besides the above, its properties also closely resembele those of copper. *Tuttha* references are available in *Caraka Saṁhitā* and *Suśruta Saṁhitā*. In the later period both the names *Tuttha* and *Śasyanka* were extensively used in *Rasa granthās*. The mythological story reflects the concept of potentiation of drugs by combining with toxic or poisonous substances.

Śānskṛt	:	*Sasyaka*
English Name	:	Peacock ore, Blue Vitriole, Bornite
Latin	:	Cupri sulphas
Hindi	:	*Nīlātothā, Tūtiyā*
Chemical Formula	:	Mineral form of the Blue Vitriol has chemical composition Cu_5FeSO_4. It contains 50-70% copper, 15-16% iron and sulphur. The chemical compostion of synthetic form is $CuSO_4$, $5H_2O$.
Hardness	:	3
Sp. Gra.	:	4.9 to 5.4
Properties	:	Crystalline, opaque. Lustre metallic, streak grayish black.

Synonyms

Sasyaka, Tuttha, Tuttham, Mayūratuttha, Śikhigrīvam, Mayūraka, Amṛitāsaṅga, Tāmragarbha, Tutthāñjana, Tutthākarpara.

Varieties

सस्यकं हि स्वभावजं तुत्थकं कृत्रिं मतम् । एकाऽभावे परं ग्राह्यं नात्र कार्या विचारणां ।। र.ज.नि.

Sasyaka is a mineral that is naturally available. It is called Peacock ore or Bornite. It appears to be an ore containing copper, but it is a compound of copper, iron and sulphur. *Tuttha* is artificially prepared in the laboratory by mixing copper, sulphur and sulphuric acid. It is called copper sulfate. *Tuttha bhasma* or *sattwa* mainly contains copper. In *Rasajalanidhi* it is quoted that 'the difference between *tuttha* and *sasyaka* lies in the fact that *tuttha* is prepared in the laboratory, where as *sasyaka* is a mineral found in nature and they can be substituted for each other.' In *Basavarajīyam* another variety named *Kṣīra tuttha* is described. As *Sasyaka* is not available in abandance, *Tuttha* can be made use of. Infact, now a days only *Tuttha* i.e. copper sulphate which is prepared in the laboratory or factories is used.

Acceptable Variety

Sasyaka (mineral), which is smooth, heavy and having lustre like that of peacock's neck is acceptable. But it is not easily available in the market. Both varieties, mineral as well as synthetic, are used as the *Bhasma* and *Satwa* obtained from both, shows equal efficacy.

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Availability

1. In India it is available naturally at Simhabhumi of Bijhar, Rajasthan and other countries like Germany, England and Sweden.
2. It is prepared at Surat, Calcutta, and Amristar artificially in the chemical industries.

Śodhana

सस्यकं शुद्धिमाप्नोति रक्तवर्गेण भावितम्। स्नेहवर्गेण संसिक्तं सप्तवारमदूषितम्।।
दोलायन्त्रेण सुस्विन्नं सस्यकं प्रहरत्रयम्। गोमहिषाज्यमूत्रेषु शुद्धयते तुत्थखर्परम्।।

र. र. स. २/१२९-१३०

Sasyaka is purified by giving 7 *bhāvanas* of the decoction of the drugs belonging to *Raktavarga* or by boiling in the substances belonging to *Snehavarga,* for 7 times (or boiling in *Snehavarga* drugs after grinding in *Raktavarga* drugs). The *Sasyaka* can also be purified by doing *śwedana* (boiling), either in cows urine or in bafallow's urine or in goats urine, in *Dolā Yantra* for 3 hours.

Māraṇa

लकुचद्रावगन्धाश्मटंकणेन समन्वितम्। निरुध्य मूषिकामध्ये म्रियते कौक्कुटैः पुटैः।।

र. र. स. २/१३१

Equal quantities of *Sasyaka*, *Gandhaka* and *Tankaṇa* are ground with juice of *Lakucha*, confined to crucible and given *kukkuṭa puṭa* to obtain the *bhasma* of *Tuttha*.

Complications

जंबीररसमादाय यः पिबेच्च दिनत्रयम् । तस्य तुत्थकशांतिस्यातद्वल्लाजेन वारिणा ।। बृ. रसराज सुंदर

Administration of impure *tuttha* leads to *vamana*, *bhrama* etc. In the event of side effects due to consuption of *Tuttha* one should consume lemon juice for 3 days or *Lājā maṇda* (gruel of puffed paddy) is taken for 3 days.

Satwapātana

सस्यकस्याथ चूर्णं तु पादसौभाग्य संयुतम् । करंजतैल मध्यस्थं दिनमेकं निधापयेत् ।।
अंधमूषास्यमध्यस्थं ध्मापयेत्कोकिलाग्निना । इन्द्रगेपाकृतिं चैव सत्वं भवति शोभनम् ।। र.र.स. २/१३२-१३३

Purified *Sasyaka* powder and 1/4th of purified *Tankaṇa* are mixed and kept in *Karañja* oil for one day. Then it is taken out and a ball is prepared out of it. Confining it in to a crucible, heated in intensive fire made of coal. This yields the *satwa* which is red like *Indragopa* (a red insect).

निम्बूद्रवाल्पटंकाभ्यां मूषामध्ये निरुध्य च । ताम्ररुपं परिध्मातं सत्वं मुंचति सस्यकम् ।।
शुद्धं सस्यं शिखिक्रान्तं पूर्वभेषजसंयुतम्। नानाविधानयोगेन सत्वं मुंचति निश्चितम् ।। र.र.स. २/१३४-१३५

If purified *Sasyaka* is mixed with 1/4th of *Tankaṇa*, ground in lemon juice, kept in a crucible and blowed in the fire, the copper coloured *satwa* is available. The purified *Sasyaka* is ground with various medicinal substances and subjected to different kinds of *satwapātana* methods, as said earlier.

Pharmacological Properties

तुत्थकं लेखनं भेदि कषायं मधुरं लघु। कृमिघ्नमथ चक्षुष्यं मेहमेदोहरं परम्।।
कफपित्तहरं बल्यं शूलहृत्कुष्ठनाशनम्। श्वित्रापहं त्वम्लपित्तहरं चैव रसायनम्।।

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तुत्थं संकोचनकरं नाडीनां बलकृत् परम्। त्वग्दोषशमनं कामं विशेषाद्रुचिरं मतम्।।
र. त. २१/१२७-१२९

तुत्थं सकटुकक्षारं कषायं विशदं लघु। लेखनं भेदि चक्षुष्यं कण्डूकृमिविषापहम्।। र.सा.स. २०१

Rasa : *Kaṭu, Kaṣaya, Tikta*

Guṇa : *Laghu, Visada*

Karma : *Viṣaghna, vāmaka, rasāyana, balya, cakṣuṣya, medohar, lekhana, bhendana*

Effection doṣa : *Kapha pittahara*

Dose : 15 – 30 mg.

Therapeutic Uses

Kaṇḍū, Krimi and disorders caused by *Viṣa. Tuttha* is used both in *aśuddha* and *śuddha* form. Generally *aśuddha Tuttha* is used externally in *Świtra, Kaṇḍū, Kuṣṭha* etc. and also in *Vraṇa.* It also cures vomitting. *Śuddha Tuttha* is useful in various skin disorders and *Krimi.* As it is *Vāmaka* it is used in *Viṣa Vikāra.* It is also used in *Prameha, Śūla, Arśa* etc. As *Tuttha* is said to be combination of both *Viṣa* and *Amṛta,* it is claimed that it is a very potent medicine. Also it is a compound of *Tāmra.* Hence the properties of *Tāmra* are also observed in *Tuttha.*

Formulations

Jatyadi Ghṛta, Tutthakodaya Vati, Sikhigrivadi Vati, Agnikumaralauha, Ajīrnabalakālanal Ras, Kanakasundara Ras, Chaturthakāri Ras, Jātyadi Taila, Talanko Ras, Trailokyacintamaṇi Ras, Trayhikāri Ras, Prāṇavallabha Ras, Plihaśārdula Ras, Mahajwarānkuśa Ras, Mahamṛtyunjaya Ras, Mahodadhi Ras, Ratnagarbhapoṭṭali Ras, Rasendra Guṭika, Vaḍavānala Ras, Vāriśoṣaṇa Ras, Śītabhanjīra Ras, Śleṣmkalanal Ras.

CAPALA

Since ancient times *capala* is considered to be a rare mineral/ore as in many texts its artificial manufacturing methods are found described. The methods for preparing *nāga sambhava capala* and *vaṅga sambhava capala* are the examples of this. Not only this, in a number of texts *capala* has not been found mentioned in any of the groups probably because of its non or uneasy availability. The statement in *Rasa Ratna Samuccaya* that only a few scholars have included it in *mahārasa* group further confirms its rareness. In pharmaceutical processing its *māraṇa* method is not described and colour of *satva* is not mentioned. This also confirms its rare nature.

Śānskṛt : *Capala*

English Name : *Bismuth*

Hindi : *Capal*

Varieties

गौरः श्वेतोरुणः कृष्णश्चपलस्तु चतुर्विधः। हेमाभश्चैव ताराभो विशेषाद्रसबन्धनः।।
शेषो तु मध्यौ लाक्षावच्छीधृद्रावौ तु निष्फलौ। वंगवद्रवते वन्हौ चपलस्तेन कीर्तितः।। र. र. स. २/१४२-१४३

Capala is of four types, based on colour, are mentioned. Of the four, viz. *Goura* (white with yello tinge), *Śweta* (white), *Aruṇa* (red) and *Kṛṣṇa* (black). Among them, the *Goura Capala* which is like

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gold and *śweta capala* which resemblas to silver are useful, especially in *Rasa bandhana.* The remaining two ie. *Aruṇa Kṛṣṇa* varities are medium in their qualities. However, if they melt like *Lākṣārasa (lac)* when put in the fire, they are considered to be useless. As it melts very qickly like *Vaṅga* (tin), it is named as *capala.*

Availability

Actually what is *capala* from modern point of view, can not be said definitely. Dr. Vamana, Ganesa, Desai writes in his work *Bhāratiya Rasa Śāstra* that *capala* of ancient times may be taken as *bismuth* which is very similar to tin metal, *i.e.,* its colour is white with slight pinkish tinge. It fuses very easily at a very low temperature and also helps in the quick fusion of associated metals. Because of these properties *capala* is considered very important in alchemy since ancient times. He further mentioned that the different varieties of *capala.* A few scholars suggest that *capala* is selemium. A few scholars suggest that *capala* melts like tin in fire and is specific in making mercury solidified or fixed. Tin melts easily and if mixed with mercury be tin ore as the presence of tin in the mineral may account for its *ativṛṣyatva.*

Śodhana

जंबीरकर्कोटक श्रृंगवेरैर्विभावनाभिश्चपलस्य शुद्धिः ।। र. र. स. २/१४७

The powdered *capala,* if ground seven times in each of the liquids viz. lemon juice, *Karkotaka* juice and ginger juice, it becomes pure.

Satvapātana

शैलं तु चूर्णयित्वा तु धान्याम्लोपविषैर्विषैः। पिण्डं बध्वातु विधिवत् पातयेच्चपलंस्तथा ।। र. र. स. २/१४७

The *capala* is powdered and *bhāvana* is given with *kāñji, Viṣa* and *Upaviṣa,* made in to a ball, kept in crucible and *satva* is extracted by subjecting to *satvapātana* process.

Pharmacological Properties

चपलो लेखनः स्निग्धो देहलोहकरो मतः। रसराज सहायः स्यात्तिक्तोष्णमधुरोमतः ।।
चपलः स्फटिकच्छाय षडस्त्रः स्निग्धको गुरुः । त्रिदोषघ्नोऽतिवृष्यश्च रसबन्ध विधायकः ।।

र. र. स. २/१४४-१४५

Rasa	:	*Tikta, Madhura*
Guṇa	:	*Snigdha, Guru*
Vīrya	:	*Uṣṇa*
Karma	:	*Lekhana, Yogavāhī, Vṛṣya, Tridoṣaghna*

Therapeutic uses

It is very helpfu in *Rasakarma* and makes the *pārada* fixed or solidified. *Capala* shines like *phaṭika.*

RASAKA

Rasaka is a mineral of *yaśada* (zinc) and *yaśada* is obtained from this mineral as *satva* by *satvapātana* method. This is on the basis of its synonym-*Ritikṛt,* used in ancient times. Here *'Rīti'* is used to denote *pittala* (Brass) which was known and made in India since time immemorial. The *Pittala* (brass) was included in *Loha group* in ancient times. In *'Rasa Ratna Samuccaya'* it is included ion

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Mīsra loha group which indicates that it is not a pure metal but a mixture of metals like zinc and copper. But from the historical evidences it is clear that the metal zinc (*yaśada*) was known or described only after 14th century A.D. and in the absence of zinc how *pittala* was made in ancient times. The only answer to this question is the knowledge of ancient scholars about *Rasaka* or *Kharpara.* And then *Rasaka* or *Karpara* was known to them, then there was no problem to make *pittala* as they could extract metallic content from it as its *satwa* and could use the same in *Pittala making.* The synonym– *Ritikṛt,* used for *Rasaka* is quite sufficient to prove this fact. It is also mentioned in *Rasendra Cūḍāmaṇi* 10th chapter that its *satwa* is like *Vaṅga* (tin). In ancient *Rasa* texts *yaśada* has been described as *Rasaka satva.* In *Caraka Saṁhitā rasaka* or *kharpara* terms have not been refered to. But in *Kuṣṭhacikitsā, Tiktālābukādi taila, dvetutthe* has been mentioned, which has been explained by *Cakrapāṇidatta* as *mayūratuttha* and *kharparikā tuttha.* In Suśruta it is not found refered to. However in *Suśruta Uttara Tantra* 18th chapter *tuttha muttamam* is mentioned which has been explained by *Ḍalhaṇa* as best quality *tuttha* is known as *mayūra grīva,* and the ordinary *tuttha* is know as *karparikā tuttha.* In *Rasa paddhati, tuttha* is described to have two types. One is *mayūra grīva* and another is *kharpara.* Thus it could be said in short that though the metal zinc was not known in ancient times its mineral *Rasaka* or *Karpara* was known and served as the source of zinc for preparing *Pittala* as a *Miśraloha.*

Śānskṛt	:	*Rasaka*
English Name	:	Calamine, *Zinc blende, Zinc mineral*
Hindi	:	*Khapariyā*

खर्परः खर्परश्चैव तदेव खर्परीयकम् । रसको रसकश्चैव मतं यशदकारणम् ।।

र. त. २१/१८१

Synonyms

Gobhaṭṭa, Rasaka, Kṣitikiṭṭa, Rasodhnhava, Kharpara, Netrarogāri, Rītikṛt, Tāmra Ranjaka, Yaśada Kāraṇ.

Varieties

In *Rasaratnasamuchchaya, rasaka* has been classified into 2 types as under:

1. Dardura 2. Kāravellaka

1. Dardura

2. Kāravellaka

The first one is said to have lamellae and is recommended for *satvapātana* purpose while the second one is without lamellae and is advised for medicinal uses. *Rasārṇava* however, mentions its three varieties basing on the appearance as under:

1. *Mṛttika* (Mud) – Zinc oxide
2. *Guḍa* (Molasses) Zinc sulfide
3. *Pāṣāṇa* (stone) – Zinc silicate / Zinc carbonate

The first one looks yellow and like earth. It is claimed to be *satvarūpa* (with least impurities) and the best. Prof. *Kulkarṇi* takes it as zinc oxide. In fire test it does not loose its weight. The *guḍābha rasaka* is considered medium and looks like jaggery. It may be taken as zinc sulphide as due to the presence of sulphur its weight is lost in fire test. The *pāṣāṇābha rasaka* is considered inferior. It may be taken as zinc silicate or zinc carbonate. It is hard like a stone. In fire test it also losses its weight

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due to the relese of CO_2. Thus, from variety point of view the description of *Rasārṇava* may be considered the best.

Description of Zinc Ores

1. Zinc Oxide (Red Zinc ore) ZnO : Zin oxide mineral is known as Zincite. Hexagonal–Crystals are homomorphic and consists of prisms, upper pyramid and lower basal pinacoid. Neutral crystals are very rare, usually compact, granular or foliated masses. Perfect basal cleavage, Hardness 4-4.5. SP. Gr. 5.7; lustre-sub admentine to vitrious, Translucent to opaque. Colour Dark red to orange yellow or yellow, streak–Raddish to orange yellow. Chemically it contains Zn 80.34% and 0 -19.65% but usually contain some Manganese and iron. It occurs at Franklin and sterling hill, New Jersey.

2. Zinc Sulphide (ZnS) : Zinc Sulphide mineral is known as sphalerite, Zinc blend or black Jack. Cubic, crystals ore common, often highly modified and distorted or rounded. Tetrahedrons with cubs. Twins according to spinal law. Generally in fine to coarse granular and compact masses, also fibrous and batry-oidal. Highly perfect cleavage, Brittle, lustre–resinous to admentine, Hardness 3.5 to 4; Sp, Gr. 3.9 to 4.2, colour varies greatly when pure white, commonly yellow, red, black or green. Varieties with high iron content have darker colour. Transparent to Translucent Streak-white, pale, yellow or brown. Chemically contains Zn. 67% and S. 33%, Usually contains Iron up to 26%. Also Manganese, Cadmium, Thallium, Indiun, Tin or mercury. Occurs extensively in dolomite, lime stones, and other sedimentary and crystalline rocks. Localities– Saxono, Bohamia, Swit-Zerland, England, Japan and U.S.A, Sphalarite is the Chief source of Zinc.

Zinc carbonate : (Zn CO_3)

Zinc carbonate mineral is known as *Smithsonited* Calamine. Hexagonal, Crystals are usually small and rough or curved. Rhombohedral cleavage, Fracture uneven to splintery. Hardness 5; Sp. Gr. 4.1 to 4.5; colour–commonly gray or brown also white, yellow, blue, green and pink. Translucent to opaque. lusture–Vitrious to pearly. Chemically it contains ZnO 64.8% and CO_2 35.2%. Iron, Copper, Manganese, Calcium, Magnesium may also be present. Smith-sonite is a secondary mineral and occurs extensively in the upper levels in lime stones and Dolomite. Occurs at broken hill, new south wales. Greece, Germany, Italy, Rhodesia, South west Africa, Scotland and Mexico.

Zinc Silicate– (Zn SiO_4)

Zinc silicate mineral is known as *willemite*. Hexagonal, crystals are either slender or thick, prismatic in habit but generally quite small, basal cleavage, fracture-Uneven. Hardness 5 to 6; Sp. Gr. 3.9 to 4.3; lustrue-Greasy-Vitrious. Colour-commonly yellow, green, brown or reddish, more rarely blue, black, white or colourless. Transparent to opaque. Chemically Zinc silicate contains ZnO 70% and SiO_4 27%, Manganese and Iron my also be present. Fuses with difficulty. Gelatinizes with HCl. Localities– Frankline and vicinity, Sussex country, New Jerssy, *Dardura* variety of *Rasaka* is obtained from Burma. In India it is obtained from Udaipur, Kashmir, Punjab, Bengal, and Madras. It is also obtained from Nepal.

Availability

At present three drugs are in use in the name of *kharpara* by *Vaidyas*. One is *Sanga Basari*. It comes from Basara town of Iran. It is mud coloured, oval shaped and hollow in middle, available as peices in the market, and is being used in eye diseases by unani physicians. The second variety is red coloured material which have the same form as mentioned above and is being used in eye diseases by

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unani physicians. The second variety is red coloured material which have the same form as mentioned above, and the third one is *pālatutam* named material, available in south Indian market. It is yellowish white and scaly. All the three are artificially made materials and these are not the minerals of Zinc. Hence, in absence of real *kharpara mineral, zinc bhasma* or *puṣpāñjana* (zinc oxide) prepared from pnrified zinc should be used in the place of *kharpara*, for example in *Vasantamālatī, yaśada bhasma* is used in place of *Kharpara.*

Śodhana

कटुकालाबुनिर्यास आलोड्य रसकं पचेत्। शुद्धं दोषविनिर्मुक्तं पीतवर्णं च जायते।।

र.र.स. २/१५३

Rasaka (Kharpara) is powdered, mixed with *Kaṭuthumbi* juice in a vessel and boiled, stirring it well. By this, *Rasaka* becomes pure, devoid of blemishes and attains yellow colour. If *Kharpara* is heated well and dippend in *Bījapūra* juice for 7 times, it becomes pure. To purify *Kharpara, it is heated well and immersed* 7 times in, either human urine or horse urine or butter milk. *Kharpara* is kept in human urine for one month (fresh urine is taken daily). By this *Kharpara* becomes pure and capable of giving golden colour (of lustre) to copper silver and mercury.

Satwa Māraṇa

तत् सत्वं तालकोपेतं प्रक्षिप्य खलु खर्परे। मर्दयेद् लोह दण्डेन भस्मीभवति निश्चितम्।। र.र.स २/१६७

Kharpara satva is mixed with equal quantity of purified *Haratāla* (orpiment) and taken in an iron pan. It is kept on fire and kept on stirring until the *Bhasma* or *Kharpara satva* is obtained.

Satwāpatana

हरिद्रा त्रिकला राल सिन्धुधूमैः सटंकणैः। सारूष्करैश्च पादांशैः साम्लैः सम्मर्ध्य खर्परम्।।
लिप्तं वृंताकमूषायां शोषयित्वा निरुध्य च। मूषां मुखोपरि न्यस्य खर्परं प्रधमेत्ततः।।
खर्परे प्रदुते ज्वाला भवेन्नीला सिता यदि। तदा संदंशतो मूषां घृत्वा कृत्वऽत्वधोमुखीम्।।
शनैरास्फालयेद्भूमौ यथा नालं न भज्यते। वंगाभं पतितं सत्वं समादाय नियोजयेत्।।
एवं त्रिचतुरैर्वारैः सर्वं सत्वं विनिःस्सरेत्।। र.र.स. २/१५७-१६१

One part of purified *Rasaka* powder and 1/4th quantity of each of *Haridra, Triphala, Lākṣarasa, Saidhava lavaṇa, Gṛhadhūma* (soot in the kitchen), *Bhallātaka* and *Tankaṇa* are taken together, ground in either *Kañji* or lemon juice. The resultant paste is applied inside the *Vṛntāka mūṣa* (crucible of the shape of *Brinjal),* dried, sealed the crucible and heated. When the *Rasaka* inside melts, bluish white flame appears at the mouth of the crucible. Then the crucible is taken out and held with the help of a pair of tongs and making crucible upside down, it is eaten on the floor. Care is taken that the neck or (cylindrical part) of the crucible is not broken. This process yields the *Kharpara Satwa* resembling to *Vanga* (tin). This is collected and kept for various purposes. Thus, same process is repeated for 3-4 times, to collect the remaining *Kharpara Satwa.*

Pharmacological Properties

रसकः सर्वमेहघ्नः कफपित्तविनाशनः। नेत्ररोगक्षयघ्नश्च लोहपारदरञ्जनः।।
नागार्जुनेन सन्विष्टौ रसश्च रसकावुभौ। श्रेष्ठौ सिद्धरसौ ख्यातौ देहलोहकरौ परम्।।

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रसश्च रसकश्चोभौ येनाग्निसहनौ कृतौ। देहलोहमयी सिद्धिर्दासी तस्य न संशयः।।

र.र.स. २/१५०-१५१

Rasa : *Kaṭu, Kaṣāya*
Guṇa : *Laghu, Śīta*
Vīrya : *Śīta*
Karma : *Cakṣuṣya, Kaphapittahara.*

Dose : 60-240mg.

Therapeutic Uses

Prameha, netra roga, kṣaya, kaphajavyādhi.

1. Madhumeha: Add equal quantituy of *kantabhasma* to *kharpara sattwa bhasma*, and take in the dose of 8 *guñja* and steep in *triphala kwātha* overnight and is to be taken with *tila taila.*
2. *Mūtrakṛchhra* : *Kharpara* is to be taken with *gokṣūra kwātha.*
3. *Jīrṇajwara : Kharpara bhasma,* if taken with *rasa sindura* cures *jīrnajwara.* It also cures *pradara, soma roga, yoni roga and rajośūla.*

Other Uses

The *Rasaka* and *Mercury* are considered as best *Sidharasas* by *Nāgarjuna*. He also confirms that, they can bestove with, both *Dehasiddhi* and *Lohasiddhi.* Those who can make these mercury and *Rasaka* sustainable in fire (that they do not melt or evaporate on heating), they can acquire and keep in their control, both *Dehasiddhi* and *Lohasiddhi.*

Formulations

Swarnamālini vasanta rasa, Laghumālini vasanta rasa, Kastūri bhairava rasa, Mahajwarānkuśa rasa, Lakṣmivilāsa rasa, Pradarāntaka rasa.

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Chapter 7
UPARASA

गन्धाश्मगैरिकासीसकांक्षीतालशिलान्जनम् । कङ्कुष्ठं चेत्युपरसाश्चाष्टौ पारदकर्मणि ।।

र.र.स. ३/१

Gandhāśma (sulphur), *gairika* (red ochre), *kāsīsa* (ferrous sulphate/green vitriol), *kāṅksī* (alum), *tala* (orpiment), śila (realger), *añjana* (collyriums) and *kaṅkuṣṭha* (rhubarb) are the eight drugs of *Uparasa* group which are useful in *paradakarmas* (mercurial processings).

Sl.	Name of the drug	Rasārṇava	Name of the Text				
			Ras Hṛdaya Tantra	Rasendra Cūḍāmani	Rasa Prakāśa. Sudhākara	Rasa Ratna. Samuccaya	Ras Kāma Dhenu
1.	*Gandhaka*	+	+	+	+	+	*Kharpara*
2.	*Gairika*	+	+	+	+	+	*Śikhi Tuttha*
3.	*Kāsīsa*	+	+	+	+	+	*Varāṭa*
4.	*Kāṅksī (sphaṭikā)*	+	+	+	+	+	*Śaṅkha*
5.	*Tālaka*	+	+	+	+	+	*Ṭaṅkaṇa*
6.	*Manaḥśila*	+	+	+	+	+	*Hiṅgula*
7.	*Añjana*	*Rājāvarta*	+	*Sauvīrāñjana*		+	+
8.	*Kaṅkuṣṭha*	+	+	+	+	+	*Bhūnāga*

Uparasa group is found described in almost all the texts while the mention of *sādhāraṇa rasa* group is found described in almost all the texts while the mention of *sādhāraṇa rasa* group is found only in *Rasa Prakāśa Sudhākara and Rasa Ratna Samuccaya.* As regards the drugs and their number *Rasa Ratna Samuccaya* along with *Rasārṇava, Rasa Ratnākara, Ras Prakāśa Sudhākara and Rasa Hṛdaya Tantra* has mentioned eight drugs in this group with little variation in the name of the drugs. The durgs are *gandhaka, gairika, kāsisa, kāṅkṣi, tālaka manaḥśila, añjana,* and *kaṅkuṣṭha. Rasa Ratnākara* mensions *rājāvarta* and *bhūnāga* instead of *añjana* and *kānkṣi.* In other *Rasa* texts where the number of the drugs of *uparasa* group is not limited to eight the *mahārasa* and *sādhāraṇa rasa* groups are not mentioned. In these texts all the minerals found useful for mercury and its operations are named *uparasas i.e.* these are inferior to *rasa* (mercury).

GANDHAKA

In *Rasa Ratna Samuccaya* its mythological origin has been described in detail. According to this, it is claimed to be related to *Goddess Pārvatī* and is said to have originated from her menstrual discharge. Its place of origin is mentioned as *śveta dvīpa* and it got its origin as a result of the churning operation of milk ocean, along with *amṛta* (nectar). Scientifically, the story may be explained as follows. The *Goddess Pārvatī* refered here represents nature, *śveta dvīpa* represents Sicily. Churning of milk ocean represents volcanic erruptions and the menstrual discharges is to be explained as the flow of liquids coming out of the places of volcanic eruptions. The mention of its specific smell is to indicate the presence of peculiar smell of sulphur in its mines. Its

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occurrence with nectar is indicative of its association with various metals at the time of the occurrence *i.e.* its occurrence in compound form. Sulphur is one of the widely visible element and constitutes 0.1 % of the earths crust. Sulphur is a nonmetallic element and exists in several different forms. Sulphur occurs mainly in two forms in free state and in combined forms. Practically pure sulphur may contain traces of solanium, tellurium and arsenic sometimes mixed with bitumen and clay. Melts at 112.8 ^{0}C and at 270^{0}C, burns with a bluish flame to sulphurdioxide. Insoluble in water and acids, soluble in carbon disulphide, turpentine oil and in chloroform. Sulphur occurs in nature as a lemon – coloured powder , as spherical or globular masses and in crystals.

Śānskṛt	:	Gandhaka
English	:	Sulphur
Hindi	:	Gandhak
Chemical Formula	:	S
Melting Point	:	115^{0}C
Boiling Point	:	440^{0}C
Hardness	:	1.5-2.5
Specific gravity	:	1.9-2.1
Colour	:	Varies from Yellow to yellowish brown, greenish gray etc.

Synonyms

Gandhaka, Sougandhika, Bali, Gauripuṣpabhava, Gandhapāṣāṇa, Pūtigandha, Kuṣṭhāri, Balivasa, Gandesa, Pāmāri, Sulbari, Rasagandha, Kīṭanaśini, Kīṭaghna, Śuka Puccha, Navanītaka, Krūragandhā, Atigandhā, Kīṭaghna, Bali, Lelītaka, Sugandhaka, Daityendra.

Gandhapāṣāṇa, Sugandhaka, and *Saugandhika* in the above point at the smell emitted by *Gandhaka.* However, there is no significant smell to *Gandhaka* when it is in its original form. Only when it is heated and melted it emits very pungent and irritating smell. (It is definitely not *Sugandha*– fragrance, not even agreeable. However the smell is distinct and characteristic). The term *'Śukapuccha'* indicates its colour resembling to that of parrot tail (feather). Infect it is yellowish having slight greenish tinge. *Śulbaripu* or *Sulbāri,* as it is means an enimy to *Tāmra* (copper). *Gandhaka* is used in the *Māraṇa* of *Tāmra* and capable of destroying its original form. Hence it is termed as *'Śulbaripu'*. *'Pāmari'* indicates its pharmacological action. *Gandhaka* is effective in the skin disease called *Pāmā* (pruritis). But it is difficult to understand the significance of the term *'Navanītaka'*.

Varieties

स वापि त्रिविधो देवी । शुकचन्चुनिभो वरः । मध्यमः पीतवर्णः स्याच्छुक्लवर्णोधमः स्मृतः ।।
चतुर्धा गन्धको ज्ञेयो वर्णैः श्वेताधिभिः खलु । श्वेतोऽत्र खटिका प्रोक्तो लेपने लोहमरणे ।।
तधा चामलसारः स्याद्यो भवेत्पीतवर्णवान् । शुकपिच्छः स एव स्याच्छ्रेष्ठो रस रसायने ।।
रक्तश्च शुकतुण्डाख्यो धातुवादविधौ वरः । दुर्लभः वृष्णवर्णश्च स जरामृत्युनाशनः ।।

र.र.स. ३/१२-१५

शुकपिच्छसमच्छायो नवीनीतसमप्रभः । मसृणः कठिनः स्निग्धः श्रेष्ठो गन्धक उच्यते ।।

आ.प्र. २/२०

Though four varieties of sulphur based on colour have been mentioned in *Rasa Ratna Samuccaya,* the uses and superiority or inferiority is mentioned only for three varieties, as the fourth black variety

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is described to be rare. The white variety is due to the presence of impurities like clay, chalk, *etc.*, and probably because of this reason it is not recommended for internal use and is considered the most inferior. The yellow variety is called *āmala sāra* and/or *śukapiccha* and recommended for *rasa karma* and *rasāyana karma,* both. The red variety is called *śukacañcunibha* or *śukatuṇḍākhya* and is recommended only for *dhātuvāda vidhi* (alchemical practices). It is claimed to be the best amongst all the three available varieties possibly because of its usefulness in *dhātuvāda* (transmutation purposes). The black variety is also claimed to be useful for removing *jarā* (senility) and *mṛtyu* (death) but its availability is described as *durlabha* (rare).

(a) Three

(1) *Śukacañcunibha* (red) - *Śreṣṭha*

(2) *Pitavarṇa* - *Madhyama*

(3) *Suklavarṇa* - *Adhama*

(b) Four

(1) *Rakta - Śukatuṇḍanibha* - For *Dhātuvāda*

(2) *Pita - Sukapiñcanibha* - For *Rasāyana karma*

(3) *Śweta - Khaṭikakāra* - *For Lohamāraṇa*

(4) *Kṛṣṇa - Durlabha* - For *Jaramrtyunāsana*

The sulphur which is clear, yellow in colour just like *haridra*, transparent, or translucent and as smooth and glistening as butter is known as *Amalasāra gandhaka* and is recommended for *Rasakarma* and *rasāyanakarma*.

Availability

Sulphur is available in its elemental (free) form, especially near the volcanic mountains. There are 'wells' of sulphur in Sicily and United States. It is obtained almost pure, by hot and high pressure of water. It is also available in Spain, Japan, Russia, Chile, Finland, Italy etc. Sulphur is available in compound form also, as sulphate and sulphide.

Some of the sulphates are as follow: Gypsum–Calcium sulphate ($CaSO_4$ $2H_2O$), Heavy Spar–Barium sulphate ($BaSO_4$), Salestone–($SrSO_4$), Kiesrite–Magnesium sulphate ($MgSO_4$, $3H_2O$), Ferrous sulphate–(FeSO4 $7H_2O$), Copper sulphate–($CuSO_4$ $5H_2O$)

Sulphides are as below: Iron Pyrites–FeS_2, Copper Pyrites or Chalcopyrites–Cu_2FeS_3, Galena–Lead sulphide–Pbs, Zinc blend–Zinc Sulphide–Zns, Realgar–Arsenic bisulphide–AS_2S_2, Orpiment–Arsenic trisulphide–AS_2S_3, Cinnabar–Mercuric Sulphide–Hgs, Apart from this, there are some organic substances, especially some plants which contain sulphur. They are Raddish, Onion, Garlic, Ananus, Mango, Banana etc.

Śodhana

पयः स्विन्नो घटीमात्रं वारिधौतो हि गन्धकः। गव्याज्यविद्रतो वस्त्राद्गलितः शुद्धिमृच्छति।।
एवं संशोधितः सोऽयं पाषाणानम्बरे त्यजेत्। घृते विषं तुषाकारं स्वयं पिण्डत्वमेति च।।
इति शुद्धो हि गन्धाश्मा नापथ्यैविकृतिं व्रजेत्। (र.र.समु. ३/२०-२२)

In the purification methods, sulphur melted with cow's ghee is poured in milk or in some prescribed vegetable extractives through a cloth so as to allow the filtered sulphur to go into the liquid. The process is advised to be repeated seven times to remove the impurities completely. This helps in

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removing the impurities in three ways. *i.e.,*

(a) by removing insoluble impurities through filtration.

(b) by solubilising fat soluble, and water soluble impurities.

(c) by adding the property of milk or the vegetable extractive.

It has been mentioned in *Rasa Ratna Samuccaya* that sulphur contains two types of impurities, *viz.* insoluble or physical impurities such as clay, stony pieces and other materials, and soluble impurities such as arsenic and other poisonous materials, *etc.* which are fat soluble or water soluble. The liquids used for its purification help in converting the melted sulphur immediately into the solid form.

Necessity for Śodhana

According to ancient and modern texts *gandhaka* contains two types impurities.

1. *Śilācūrṇa* (Stone powder or clay)

2. *Viṣa* (Arsenic etc.) if these impurities are not removed before use *gandhaka* is likely to produce following diseases viz. *Kuṣṭha, tapa, bhrama, paittic diseases, bala, varṇa, sukha* and *vīryahāni*, Hence it must be purified before use.

Gandhaka Vikāra Śānti

If some unwant symptoms are produced through its use, it should be discontinued and the patient may be given sufficient milk mixed with ghee. For therapeutic purposes purified sulphur may be used internally mainly for skin disorders.

Gandhaka druti

कलांशव्योषं संयुक्तं गन्धकं श्लक्षण चूर्णितम्। अरत्निमात्रे वस्त्रे तद्विप्रकीर्य विवेश्ट्य तत्।।
सूत्रेण वेष्टयित्वाऽथ यामं तैले निमज्जयेत्। घृत्वा संदंशतो वर्तिमध्यं प्रज्वालयेच्य तम्।।
दुतो निपतितो गन्धो बिन्दुशः काचभाजने। (र.र.स. ३/२७-२८)

Mix sulphur powder with 16th part of *Vyoṣa* powder, spread it on one *Aratni* (about 16") diameter cloth piece, roll it and tie it with thread. Soak it in the oil for one *Yāma*. Hold it with forcep in its middle and burn it. By this method sulphur melts and falls into the glasspot drop by drop. Put three drops of this liquefied sulphur on the *Nāgavallī* leaf, add pure mercury in one *balla* (about 375 mg) quantity and rub it with a finger. Now eat this *druti* (liquefied sulphur) and mercury along with the leaf. It makes digestive fire highly stimulated, destroys, *Kṣaya, Pāṇḍu; Śvāsa, Kāsa,* abdominal pain, severe type of *Grahaṇī* (sprue syndrome). It immediately destroys *Āma doṣa* and produces lightness in the body.

Pharmacological properties

गन्धाश्मातिरसायनः सुमधुरः पाके कटूष्णोमतः। कण्डूकुष्ठ विसर्पदद्रुदलनो दीप्तानलः पाचनः।।
आमोन्मोचन शोषणो विषहरः सूतेन्द्रवीर्यप्रदः। गौरीपुष्पभवस्तथा कृमिहरः सत्वात्मकः सूतजित्।।
र.र.स. ३/१६

शुद्धगन्धो हरेद्रोगान् कुष्ठमृत्युजरादिकान्। अग्निकारी महानुष्णो वीर्यवृद्धिं करोति च।।
र.र.स. ३/४५

इत्थं विशुद्धस्त्रिफलाज्यभृंग मध्वन्वितः शाणमितो हि लीढः।
गृध्राक्षि तुल्यं कुरूतेऽक्षियुग्मं करोति रोगाज्जितदीर्घमायुः।। र.र.स. ३/२६

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Rasa : *Kaṭu, tikta, kaṣaya*

Guṇa : *Uṣṇa, Sara*

Vīrya : *Uṣṇa*

Vipaka : *Madhura , Kaṭu*

Karma : *Dīpana, pācana, viṣahara, jantughna, kṛmihara , agnikārak, rasasoṣana, rasāyana, vedhi, sūtamurcchana - prada, sūtajit, balavirya – vardhaka, dīrghayuṣkara, driṣṭisakti-vardhaka, jantu- kaṇḍu- visarpa- jit.*

Effect on doṣa : Pittala, kaphavātahara

Dose : *Suddha gandhaka* can be given in the dose of 1 *ratti* to 8 *ratti*

Therapeutic uses

Kaṇḍu, kuṣṭha, visarpa, dadru, twakdoṣa, āmadoṣa, viṣadoṣa , bhūtadoṣa, kṛmidoṣa, pliharoga, kṣayaroga, jarāroga, netraroga, jwarādiroga, mṛtyu, kāsa, āmajirna, mandāgni, balakṣaya in all thes conditions *gandhaka* is useful.

Formulations

Arśakuṭār Ras, Kajjali, Kanaksundar Ras, Gandhak Vaṭi, Grahaṇikapaṭ Ras, Jayamangal Ras, Trisundar Ras, Pañcāmṛta Parpaṭi, Makaradwaj, Mṛtyunjaya Vaṭi, Mahajawarankuś Ras, Ratnagiri Ras, Rasparpaṭī, Rasa Sindur, Lauha Parpaṭi, Vijayabhairava Ras, Vetāl Ras, Ṣaḍānan Ras, Samirpannag Ras, Saubhāgya Vaṭi, Swarna Parpaṭi, Hanspoṭṭali

Gandhaka Rasāyana

शुद्धसूतपले द्वे च चत्वारो गन्धकस्य च। बालुकायन्त्रगं पक्वं जायते भस्मसूतकम्।।
तस्य सूतस्य भागैकं तत्समं कुरू गन्धकम्। गन्धकेन समं शुल्वतुल्यमयो मृतम्।।
पिप्लीञ्च क्षिपेत्तस्मिन् सर्वमेकत्र कारयेत् मातुलुङ्गरसैः पेष्यं लेहयेन्मधुसर्पिषा।।
संवत्सरप्रयोगेण वज्रकायो भवेन्नरः।। (रसयोगसागरः १८२८)

Ingredients

1. *Gandhaka* - *210 gm.*
2. *Rasa sindhūr* - *210 gm.*
3. *Tāmra bhasma* - *210 gm.*
4. *Lauhabhasma* - *210 gm.*
5. *Pippali* - *210 gm.*
6. *Mātulunga Swarasa* - *210 gm.*

Dose : 2 Māṣa

Anupāna : As per disease

Therapeutic Uses

Kaṇḍu, Pāma, Viṣa doṣa, Pāṇḍu, Muṣka Vṛddhi, Jīrṇa Jwara, Prameha, Vāta roga.

Gandhakavaṭi (Prathama)

शुद्धगन्धकभागैकं सत्वं शुण्ठ्याञ्चतुगुगम्। निम्बुनीरेण सम्मर्ध सप्तवारं विशेषतः।।
पुनीञ्च सैन्धवं क्षेप्यं यथारूचि भिषग्वरैः।। चणकप्रमितां कुर्याद्वटिकां रूचिदायिनीम्।।

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भोजनान्ते सदा देया गन्धकाख्या वटी शुभा । (रसयोगसागरः १८३०.१८३२)

Ingredients

1 Gandhaka	-	*210 gm.*
2 Śuṇṭi satva	-	*840 gm.*
3 Saindhava Lavaṇa	-	*q.s.*

Dose : *Caṇak*

Karma : *Dīpana*

Mahāgandhaka

रसगन्धकयोः कर्ष ग्राह्यमेकं सुशोधितम्। ततः कज्जलिकां कृत्वा मृदुपाकेन साधयेत्।।
जात्याः फलं तथा कोषं लवङ्गारिष्टपत्रके। (सिन्दुवारदलं चैव एलाबीजं तथैव च)।।
एतेषां कर्षमात्रेण तोयेन सह मर्दयेत्। मुक्तागृहे पुनः स्थाप्यं पुटपाकेन साधयेत्।।
धनपडके बहिर्लिप्त्वा पुटमध्ये निधापयेत्। गुञ्जाषट्कप्रमाणेन प्रत्यहं भक्षयेत्ररः।।
एतत्प्रोक्त कुमाराणां रक्षणाय महौषधम्। ज्वरघ्नं दीपनञ्जैव बलवर्णप्रसादनम्।।
दुर्वारं ग्रहणीरोग जयत्येव प्रवाहिकाम् । सूतिकाञ्ज जयेदेतदपि वैद्यविवर्जिताम्।।
कासश्वासातिसारघ्नं वाजीकरणमुत्तमम् । बालरोगं निहन्त्याशु सर्वोपन्द्रवसंयुतम्।।
पिशाचा दानवा दैत्याबालानां ये विद्यातकाः। यत्रौपधवरस्तिष्ठे त्तत्र सीमां त्यजन्ति ते।।
बलानां गदयुक्तानां स्त्रीणाञ्जापि विशेषतः। महागन्धकमेतद्धि सर्वव्याधिनिषूदनम्।।
बिना पाकेन सर्वाङ्गसुन्दरोऽयं प्रकीर्त्तितः।। (भै. र. ग्रहणीरोगाचिकित्सा २९२-३००)

Ingredients

1. Pārada	-	*167 gm*
2. Gandhaka	-	*167 gm*
3. Jayaphala	-	*167 gm*
4. Jāvitri	-	*167 gm*
5. Lavanga	-	*167 gm*
6. Nimba patra	-	*167 gm*
7. Sukti	-	*q.s.*
8. Kadalipatra	-	*q.s.*

Dose : 6 ratti.

Therapeutic Uses

Grahaṇi roga, Pravāhika, Sūtika roga, Kāsa, Śwāsa, Atisāra.

GAIRIKA

Gairika references are avialable extensively in *Caraka saṁmhitā* and other texts. It is an oxide of iron having red colour and generally in powder form. Chemically it contains 70% iron and 30% oxygen. In addition, it often contains magnesium and titanium. *Gairika* occurs in compact, granular, or earthy masses, sometimes in crystal form also. The earthy varieties are apparently soft but crystalline hematite is hard. Red ochre is red earthy hematite. It is very soft and possesses a dull lustre. It often

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contains considerable amount of clay, sand and other impurities. The word hematite means bloodlike. It is a mineral that supplies most of the worlds iron. It is a ferric oxide (a compound of iron and oxygen) and in its pure form, hematite consists of abour 70% iron. The mineral occurs in variety of forms , including shiny crystals, grainy rock and earthy material. Hematite is brownish- red or dark red, but a fresh scratch on hematite rock is blood- red.

Śānskṛt	:	Gairika
English Name	:	Haematite, Redoxide of Iron.
Hindi	:	Sona Geru
Chemical Formula	:	Fe_2O_3
Hardness	:	5.5 to 6.5
Sp. Gr.	:	4.9 -5.3

Synonyms

Gaireya, Girimrittika, Raktadhātu, Lohadhātu, Girimṛdbhava, Girija, Girimṛta etc.

Availability

In India, Red ochre is an earthy form of hematite occurs in Singbhoom (Bihar), Mayurbhanja, Sundergarh (Orissa), Bettari, Chikmanglore, Shimoga (Karnataka), and Kornul, Adilabad, warangal (Andhra Pradesh).

About 20% of iron produced in North America comes from hematite. Large amount of haematite also occur near the border of Labrodor and Queba and in Ontario. Other sources include Astralia, Brazil and South Africa. Hematite found with other iron minerals in igneous rocks and metamorphic rocks, as well as sedimentary rocks.

Varieties

पाषाणगैरिकं चैकं द्वितीयं स्वर्णगैरिकम् ।। र.र.स. ३/४६

द्विविधं गैरिकं प्राहुः स्वर्णं सामान्यगैरिकम् । परस्तृतीयमप्युक्तं पाषाणाख्यं हि गैरिकम् ।। आ.प्र. २

Tow main varieties of *gairika* are mentioned in *Āyurveda : pāṣāṇa gairika* - hard and copperish in colour, and *svarṇa gairika*-soft, smooth and deep red. The *pāṣāṇa gairka* is the hard variety of hematite, while the *svarṇa gairika* is the earthy variety. In *Āyurveda Prakāśa* a third variety, *sāmānya gairika,* is also mentioned which is in between the *pāṣāṇa* and *savrṇa* varieties, *i.e.,* it may contain less clay and sand. The percentage of iron is very high in *pāsāṇa gairika* and in modern times iron is generally extracted from this variety of hematite.

Significance of the term svarṇa gairika

The term *svarṇa* added to this mineral is to indicate its brilliant red colour or to indicate its usefulness in making gold very bright and shining, as it is used by the goldsmiths for polishing gold. However, it does not contain gold even in traces. It occurs abundantly in various parts of India.

Acceptable Variety

Swarṇa- gairika is supposed to be the best variety, which is used for medicinal purpose. It is soft and unctuous looking. It is only purified and not required to undergo incineration process.

Śodhana

गैरिकं तु गवां दुग्धैर्भावितं शुद्धिमृच्छति । र.र.स. ३/४९

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गैरिकं किञ्चदाज्येन भृष्टं शुद्धं प्रजायते । आ.प्र. २/२७२

Fine powder of *Swarṇa-gairika* is mixed with 1/4 to 1/8 parts of cow's ghee and roasted on low flame. Then it gets purified. Another method of its purification is to process *Swarṇa-gairika* with cows milk. But it has to be used immediately, as it becomes rancid after few hours. Hence, *gairika* is purified and used immediately. Like *Gandhaka*, *Gairika* is used directly after it is purified. There is no mention of incinerating of *Gairika* to prepare a *bhasma* of it.

Satwapātana

Nandi has stated that it is in the form of *satva* (metal) but others mention that its *satwa* can be extracted by treating it with *kṣāra* and *āmla*. (According to Prof. D.A. Kulkarni iron may be extracted as its *satva* and that iron is more effective than ordinary iron.)

Pharmacological Properties

स्वादुस्निग्धं हिमं नेत्र्यं कषायं रक्तपित्तनुत् । हिध्मावमिविषघ्नं च रक्तघ्नं स्वर्णगैरिकम् ।। र.र.स. ३/४७

अतिकण्डूहरं रूक्षं तथा प्रोक्तमुदर्दनुत् । आ.प्र. २/२११

Rasa : *Madhura, Kaṣāya*

Guṇa : *Snigdha, śīta*

Vīrya : *Śīta*

Karma : *Cakṣuṣya, raktastambhaka*

Dose : 2-4 *ratti*. (250 mg - 500 mg).

Therapeutic uses

Raktapitta, hikkā, vamana, viṣa vikāra, kaṇḍu and *udarda*. Purified *Gairika* mitigates vomiting and hiccup. It is useful in anaemia, menorrhegia and bleeding. Externally, it is used as an ointment for promoting wound healing. It also relieves itching in urticaria, when its paste is applied topically.

Formulations

Irimedadi Taila, Kandarp Ras, Kandarpsundar Ras, Kṛmighātini Guṭika, Gairikādhya Pralepa, Jātyādi Taila, Jīrṇajwaraghni Vaṭi, Jwarakunjarapārīndra Ras, Jwarānkuś Ras, Dwādasayaś, Niśādhyanjan, Pakṣmasātahar Lep, Puṣyānug Cūrṇa, Pradarantak Lauha, Mahajwarankuś Ras, Viṣamjwarantak Lauha, Vraṇasukahari Varti, Sleṣmaśailendra Ras, Sahakār Vaṭi, Somghṛta

KĀŚĪSA

Kāsīsa is a green coloured mineral of iron which is chemically ferrous sulphate. In *Rasa Ratna Samuccaya* its two varieties, *viz., bālukā kāsīsa* and *puṣpa kāsīsa* are mentioned. *Bālukā kāsīsa* and *pāṃśu kāsīsa* are the same and may be called *dhātu kāsīsa* also. It is greenish and granular. The *puṣpa kāsīsa* is yellowish. *Bālukā kāsīsa* converts itself into *puṣpa kāsīsa* in course of time on account of exposure to atmosphere. *Bālukā kāsīsa* is soluble in water while *puṣpa kāsīsa* is insoluble. In local market it is sold in the name of *hīrākas* and is available in the form of big crystals. Now a days it is also prepared artificially by the reaction of sulphuric acid on iron. In *Rasārṇava* its white and black varieties are also mentioned along with the yellow variety. The white variety is due to the mixture of chalk, or it may be an intermediate state of conversion of *bālukā kāsīsa* to *puṣpa kāsīsa*. The black variety is due to the mixture of black soil with *kāsīsa*.

Śānskṛt : *Kāśīsam*

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English : Green vitriol, Ferrous sulphate
Hindi : *Kāśīs*
Chemical Formula : $FeSO_4$

Synonyms

Ayogandhāśmasambhūta, Dhātukāśīs, Kāśīs, Paṁśuk, Khaga, Paṁśukāśīs, Khecar, Puṣpkāśīs.

Varieties

कसीसं वालुकाद्येकं पुष्पपूर्वमथापरम् ।। र.र.स. ३/५१

Kāśīsa is of two variteies viz; *Vāluka Kāśīsa* and *Puṣpa Kāśīsa.* Since ancient times, *Kāsīsa* was found in native form as well as made artificially. Now a days it is mostly made artificially. Of the two former is native and later is artificially made. Some times it is also observed that on keeping *Kāsīsa* for longer period the artificially made *Kāsīsa* crystals convert into white coloured powder form and that is known as *Puṣpakāsīsa.* In medical shops it is available as sulphate of Iron. It may be used for medicinal purposes. The native *Kāsīsa* is generally not available in present times.

Śodhana

सकृद्भृंगाम्बुना ल्किन्नं कासीसं निर्मलं भवेत् । कासीसं शुद्धिमाप्नोति पित्तैश्च रजसा स्त्रियः ।। र.र.स. ३/५४

For the purification of *Kāśīsa,* it is given of *bhāvana Bhṛṅgarāja* juice or it may be kept immersed in the same juice. It can also be purified by keeping or grinding the powdered *Kāśīsa* in the *pitta* (bile) of animals, or menustrual fluid of women.

Māraṇa

स्नुहीपत्ररसैर्यद्वा मार्दितं पुटितं मुहुः । निरम्लीभावपर्यन्तं कासीसं भस्मतामियात् ।। र.त. २१/२५९

Purified *Kāśīsa* is powdered and processed with the juice of leaves of *Snuhi* (Euphorbia nerifolia) for 7 times. Then the *cakrika* are prepared and dried and sealed into *śarāva* and subjected for a *Laghu puṭa*. This procedure is continued till *Kāśīsa* loses its sourness or acidity. Finally, a red coloured *bhasma* is formed.

Satvapātana

तुवरीसत्त्ववत् सत्त्वमेतस्यापि समाहरेत् । र.र.स. ३/५४

Satva is obtained from the *Kāśīsa,* if it is subjected to *satvapātana* like that of *Tuvari (Sphaṭika alum).*

Pharmacological Properties

कासीसद्वयमम्लोष्णं तिक्तं च तुबरं तथा । वातश्लेष्महरं केश्यं नेत्र्यं कण्डूविषप्रणुत् ।।
मूत्रकृच्छ्राश्मरीश्वित्रनाशनं परिकीर्तिम् ।। आ.प्र. २/२७५

Rasa : *Āmla, Kaṣāya*
Guṇa : *Snigdha*
Vīrya : *Uṣṇa*
Kārma : *Balya, Netrya, Kesarañjana, ārtavajanana, Vāta Sleṣmahara,*
Dose : 60 to 240 mg
Anupāna : *Hony, ghee*

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Therapeutic Uses

Viṣa, Śvitra, Pāṇḍu, Plīha Rogas, Kaṇḍu, Mūtrakṛchra, Aśmari.

Formulations

Ekatriśāngavarti, Kāsīsabaddha ras, Kāsīsādi Guṭika, Kāsīsadi ras, Kāsīsādya Taila, Kumārikavaṭi, Catusudha Ras, Pañcānan Taila, Pliharivaṭī, Bhṛhat cintamaṇiras, Mahābidyaguṭi, Rajah Pravartinivaṭi, Loharasāyana, Vedavidyā vaṭi, Śaṅkhadravakomahan, Śītapittabhañjana ras, świtrāri ras, Hinguadi taila.

KĀṄKṢI

It is described in *Rasa Ratna Samuccaya* that it is obtained from the rocks of *Saurāṣṭra* in the form of clay. It is further said about it that if it is pasted on the cloth it deepens the colour of *mañjiṣṭha* or makes its colour very fast. As per modern concept, it is presumed that in places where aluminium and sulphur are present as the constituents of soil, the rocks of all such places may contain alum in some amount. In India *Saurāṣṭra* was the first recognised place for such soil. Hence the soil obtained from here and containing alum is known as *Saurāṣṭrī*. It is full of impurities and from this pure, white and crystalline alum is obtained with great efforts. Alum is a white crystalline solid having an astringent taste. It is readily soluble in water. Its solution in water is acidic. On further heating, water of crystallization evaporates and it swells. The swollen mass is called 'burnt alum'. Initially the earth containing alum was obtained from *Saurāṣtra* and supplied throughout India, but later on it was also found in Punjab, Bihar, U.P. and *Maharāṣṭra*. It is a type of soil in which aluminium and sulphur are present in a specific combination. It may be obtained either from hilly areas or from planes.

Śānskṛt	:	*Sphaṭikā, Kāṅkṣi*
English Name	:	Alum, Potash alum, Double sulphate of aluminium and potassium.
Hindi	:	Phitkari
Chemical Formula	:	K_2SO_4, $Al_2(SO_4)_3$, $24H_2O$.
Specific Gravity	:	1.75
Melting Point	:	92 ^{0}C

Synonyms

Sphaṭika, Tuvari, Phaṭika, Śubhra, Rangada, Dridharanga, Souraṣtri, Suramrittika, Khaṭika, Piṭika etc.

Availability

The main source of alum as a mineral is *Sourāṣṭra*. Other sources are Panjab, Nepal, Bihar, Goa, and Uttar Pradesh. Now a days, artificially prepared alum is used for medicinal purpose. Alum is found in shales (Alum shales), which contain pyrites. It also occurs in neighbourhood of volcanoes.

Varieties

Two varieties of *Kankṣi* have been mentioned in texts viz. *Phaṭaki* and *Phullika*.

(1) *Phaṭaki Kānkṣi* : Yellowish, heavy, unctuous looking; also known as Pitika. It is found as a mineral.

(2) *Phullika Kānkṣi* : Snow-white, slightly sour and astringent, unctuous looking. It is also known as *Phullatuvari* (Potash alum).

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Acceptable variety

Alum, which is clean, white and heavy, is the best..

Śodhana

स्फटिका निर्मला श्वेता श्रेष्ठा स्याच्छोधनं क्वचित् । न दृष्टं शास्त्रतो, लोका वह्नावुत्फुल्लयन्ति हि ।।

(आयुर्वेदप्रकाश २/२५८)

तुवरी कांजिके क्षिप्ता त्रिदिनाच्छुद्धिमृच्छति ।। (र.र.स. ३/६४)

Alum, which is clean, white and crystalline, seldom required purification. In practice, it is burnt and then used. There are few other methods of purification of *Kānkṣi*. It is soaked in the sour gruel (*kāñji*) for 3 days. The Quantity of gruel should be very little, so as to dissolve just the impurities in *Kānkṣi*. Otherwise if gruel is taken in large quantity, all the alum will get dissolved. Another method is to dissolve *Kānkṣi* in water and filter. The filtered water is slowly heated and evaporated. This is also rational method to purify the *Kānkṣi*.

Śatvapātana

क्षाराम्लैर्मर्दिता ध्माता सत्त्वं मुचति निश्चितम् । गोपित्तेन शतं वारान् सौराष्ट्रीं भावयेत्ततः ।
धमित्वा पातयेत्सत्त्वं क्रामणं चातिगुह्यकम् ।। र.र.स. ३/६५

Kānkṣi is grinded with *kṣāra*, like *Yavakṣāra* and *sour gruel* (*Kāñji*) and a pulp formed, is subjected for heating in *Vṛntāka muṣa* or *Andha mūṣa*. The *sattva* an active ingredient gets separated out in a form of aluminium metal. Another procedure mentioned, is to process (*bhāvana*) it with the bile of a cow for 100 times. This extract is useful in *Pārada saṁskāras*. The medicinal uses of the extract are not mentioned.

Pharmacological Properties

कांक्षी कषाया कटुकाम्लकण्ठ्या केश्या व्रणघ्नी विषनाशिनी च ।
श्वित्रापहा नेत्रहिता त्रिदोषशान्तिप्रदा पारदजारिणी च ।। र.र, स. ३/६३

Rasa : *Kaṣāya, Kaṭu, Āmla*
Karma : *Vraṇaropaṇa, Grāhī, samkocakārī, Keśya*
Effect on doṣa : *Tridoṣahara*

Dose : 240 to 480 mg with sugar.

Therapeutic Uses

Raktāsrava, mukharoga, Śvitra, Viṣa.

It is also useful for *Jāraṇa Karma* of *Pārada,* purified alum is haemostatic, hence used to arrest the bleeding. The paste is applied in tinea versiculor, a skin disease. Eye drops of alum are useful in eye diseases. Alum diluted in water is used as a vaginal douche. Alum water is given orally in poisoning. Because of its potent astringent property. It delays the absorption of toxins from gastric mucosa. Meanwhile the toxins in the stomach are removed by gastric lavage. Alum promotes the wound healing. It is beneficial in diarrhoea. In stomatal ulcers, dental ill- hygiene and uvulitis, the gargles of alum water are recommended. Alum water wash is helpful in eczema.

Formulations

Elādimanth, Garuḍānjana, Catuhsudharasa, Nayanaśoṇānjan, Dravakoras, Viṣkalpa, Śankhadravakoras.

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HARATAL

Mythologically it is said to have originated from the discharge produced at the end of sexual act of *Lord Śiva* and *Goddess Pārvatī*. Orpiment, though more abundant than realger, is not a common mineral. It is usually found in foliated or columnar masses with a bright yellow colour. The pure mineral contains 39% sulphur and 61% arsenic. Thus it contains about 9% more sulphur than realgar. Folios are flexible but not elastic; slightly sectile; lustre resinous to pearly; colour lemon-yellow; streak translucent to opaque. When heated to 100°C it becomes red, however resumes its original colour on cooling but on heating to 150°C the change is permanent. It is commonly associated with realger and often formed from it. It is found in nature and prepared artificially also by the treatment of arsenic acid with H_2S under high pressure.

Śānskṛt	:	Haratāla, Tālaka
English Name	:	Orpiment
Hindi	:	Hartal
Chemical Formula	:	$AS_2 S_3$ it is trisulphide of Arsenic. (61% Arsenic).
Hardness	:	1.5-2.0
Sp. Gr.	:	3.5

Synonyms

हरितालं तालमालं मालं शैलभूषणम् । पिञ्जकं रोमहरणं तालकं पीतमित्यपि ।। र.सा.स. १६७

Āla, Karcūra, Kharjūra, Citragandha, Tāla, Tālak, Naṭabhūṣaṇa, Naṭamaṇḍanak, Piñjara, Pītanak, Mallagandhaja, Romahṛt, Vamśpatra, Vangāri, Viḍālak, Śailabhūṣaṇa, Hartal, Harital, Māla.

Varieties

हरतालं द्विधा प्रोक्तं पत्राद्यं पिण्डसंज्ञकम् । स्वर्णं गुरुस्तिग्धं तनुपत्रं च भासुरम् ।।
तत्पत्रतालकं प्रोक्तं बहुपत्र रसायनम् । निष्पत्रं पिण्डसदृशं स्वल्प सत्वं तथा गुरु ।
स्त्रीपुष्पहरणं तत्तु गुणाल्पं पिण्डतालकम् ।। र.र.स. ३/६६-६७

Haratāla (orpiment) is of two types. viz. *Patra Haratāla* and *Piṇḍa Haratāla. Patra Haratāla* is golden in colour. heavy and *Snigdha*. It contains small layers and is bright. The *Haratāla* which has more number of layers, is consumed as *Rasāyana.* The *Piṇḍa Haratala*, which is massive and without layers has less potency. It is heavy and has lesser qualities than that of *Patra Haratāla*. This causes *Arthava naṣa* (stoppage of menustrual fluid) in women.

Availability

Generally occurs alongwith Realgar (*Manahśilā*), at hot spring deposits and at Arsenic veins. Available at U.S.A., Peru, Hungary , Yugoslavia. In India, it occurs in very small quantity near Darjeeling and Kashmir and at Kumaun hills. Hence, much of the orpiment is being imported to India.

Śodhana

स्विन्नं कूष्माण्डतोये वा तिलक्षारजलेऽपिवा। तोये वा चूर्णसंयुक्ते दोलायन्त्रेण शुद्धयति ।।
तालकं कणशः कृत्वा दशांशेन च टण्कणम्। जम्बीरोत्थद्रवैः ज्ञात्यं कार्जिकैः ज्ञालयेत्तथा ।।
वस्त्रे चतुर्गुणे बद्ध्वा ढोलायन्त्रे दिनं पत्रेत् ।।
सचूर्णेनारनालेन दिनं कुष्णरण्डजे रसे। खेद्य वा शाल्मलीतोयैस्तालकं शुद्धिमाप्रुयात् ।। र. र. स. ३/७०-७३

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Haratāla is boiled in each of the liquids such as juice of *Kūṣmāṇda,* lime water and *Tila Taila* (in dolayantra for 3 hours in each). Which makes it devoid of *doṣas*. *Haratāla* is powdered coarsely and mixed with 1\10 of *Tankaṇa* powder. The mixture is then washed with juice of *Jambira* and *Kāñji*. Then it is tied in to four fold cloth to prepare *poṭṭali* and boiled in the mixture of lime water and *Kāñji* in *dolāyantra* for a day. It can also be purified by boiling in juice of *Kūṣmāṇḍa* or *Śālmali* for a whole day, with the help of *Dolayantra.* The *poṭṭali* is prepared as said above. This will Purify the *Haratāla.*

Generally *suddha Haratāla* or *Haratāla bhasma* are not given alone. Other herbal powders are mixed with it and administered.

Rasamāṇikya

तालकं वंशपत्राख्यं कूष्माण्डसलिले क्षिपेत् । सप्तधा वा त्रिधा वाऽपि दध्ना चाम्लेन वा पुनः ।।
शोधयित्वा पुनः शुष्कं चूर्णयत् तण्डुलाकृतिः । ततः शरावके पात्रे स्थापयेत् कुशलो भिषक् ।।
बदरीपल्लवोत्थेन कल्केन लेपयेद्भिषक् । अरुणाभमधः पात्रं तावज्ज्वाला प्रीदयते ।।
स्वाङ्गशीतं समुद्धृत्य माणिक्याभं भवेद् ध्रुवम् । तत् रक्तिद्वितयं खादेद्घृतभ्रामरमर्दितम् ।।

र.स.सं. १८२-१८५

Method-1 : Vaṁśapatra Haratāla (Patra Haratāla) is boiled in the juice of *Kūṣmāṇḍa* or sour curds for 3 times or 7 times, in *Dolāyantra.* Then it is washed and dried and crushed to small particles to the size of rice grain. These are confined to *Śarāva sampuṭa* and sealed with the paste prepared out of *Badara* leaves. It is then heated until the *Śarāva* becomes red hot. After self cold, the *Rasamāṇikya* is obtained, which shines like *Māṇikya* (ruby). Here the *Śuddha Haratāla* is confined to *Śarāva sampuṭa* and heated until the lower *Śarava* becomes red hot. However, it is difficult to ascertain whether *Rasamāṇikya* is ready. Hence a glass bottle or empty electric bulb (inside filaments removed) is used for the preparation. It melts on low temperature and after evaporation of sulphur, reddish residue remains which is *Rasamāṇikya.* It is visible in transparent glass, hence can be identified easily.

Method-2 : After purification, a small quantity of the powder of *Haratāla* is spread in between the two broad sheets of white mica. These two mica sheets containing *Haratāla* should be carefully taken by forceps are fixed with stapler pins. It is heated over a flame. Within a short while the colour turns to red and *Rasamāṇikya* will be ready. As mica is transparent, it is easy to identify the redness. Then it should be removed from fire, and after it is cooled of its own, mica sheets should be carefully separated and the red scale like substance should be collected. This has to be triturated in a pestle and mortar, made to a fine powder and stored in a glass bottle and this *Rasamāṇikya* is used in the treatment of diseases.

Dose : Though the dosage has been indicated as 2 *ratti* (250 mg.), generally it is advised to administer in the dosage of 60 mg. to 125 mg.

Anupāna : *Ghṛta* and *madhu.*

Complications due to Asuddha Haratāla Sevana

अशुद्धं तालमायुघ्नं कफमारूतमेहकृत् । तापस्फोटां गसको चं कुरूते तेन शोधयेत् ।। र. र. स. ३/६९

Haratāla, consumed without proper purification shortens the life span, causes diseases of *Kapha* and *Vāta,* as well as *Prameha*. It is responsible for *Santāpa* (burning sensation) in the body, *Sphoṭa* (boils) and *Snāyu sankocha* (contraction of blood vessels and muscles). Hance it should necessarily be subjected to purification.

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Pharmacological Properties

श्लेष्मरक्तविषवातभूतनुत् केवलश्च खलु पुष्पहत्त्रियाः स्निग्धमुष्ण कटुकंच दीपनं कुष्ठहारि हरतालमुच्यते ।।

र. र. स. ३/६८

Rasa	:	*Kaṭu*
Guṇa	:	*Snigdha, Uṣṇa*
Vīrya	:	*Uṣṇa*
Kārma	:	*Sleṣmaroga hara, Rakta doṣahara, vātahara, Viṣahara, Bhūtahara.*

Therapeutic uses

Vātaroga, Sleṣmaroga, Raktapitta, Vātarakta, Kuṣṭha, Kaṇḍū, Visarpa, Dadru, Pāmā, Slīpada, Viṣaroga, Jwara, Kaṭigraha, Gudāmaya, Kṣaya, Prameha, Āsyaroga, Kāca, Kṣaya, Kāsa, Śwāsa, Vraṇa, Raktavikāra, Kaphapittajaroga, Mṛtyu.

Dose : 1/8 to 1 ratti (15mg to 30 mg.)

Formulations

Kastūribhairava Ras, Kṛmikāṣṭanala Ras, Gulmakālanal Ras, Chaṇḍkeśwar ras, Tālak Bhasma, Tālakeśwar Ras, Tālsindūr, Nityānanda Ras, Bhūtaṇkuśa Ras, Manthana Bhairava Ras, Raktapittāntak Ras, Rasmāṇikya, Rasendraguṭika (Bṛhad), Vātagajāṇkuśa Ras, Vātaraktāntak Ras, Vidhyādhar Ras, Vetal Ras, Sannipatabhairava Ras, Samīrpannaga Ras, Sarveśwari Ras.

MANAḤŚILĀ

It is a drug or mineral of *uparasa* group which occurs as bright red incrustations and coatings on other substances. Colour is aurelian red to orange yellow; transparent to translucent or opaque. *Manaḥśilā* contains 71.1% As and 29.9% S. It catches fire when heated on charcoal and burns with a light blue flame giving out dense clouds of arsenic fumes and odour of SO_2. Its bright red colour and its reactions for sulphur distinguish it from other minerals and its softness, low sp. gr. and the aresenic fumes distinguish it from cinnabar. On exposure to air and light realgar gets oxidised yielding orpiment (As_2S_3) and arsenolite (As_2O_3). Realgar occurs as a bright-red incrustations and coatings on other substances, as compact and gradular masses and as crystals implanted on other minerals. Its crystals are short monoclinic and prismatic. Cleavage distinct. It is sectile and soft conchoidal fracture, resinous lusture.

Śānskṛt	:	*Manaḥśilā*
English Name	:	Realgar
Hindi	:	*Mainśilā*
Chemical Formula	:	Arsenic Disulphide (As_2S_2)
Hardness	:	1.5-2.0
Sp. Gr.	:	3.5

Synonyms

मनःशिला च नैपाली शिलाह्वा नागजिह्विका । मनोह्वा कुनटी गौणी करञ्जी करवीरिका।
मनोह्वा त्वोड्रपुष्पाभा शस्यते सर्वकर्म्मसु ।। र.सा.स. १८८

Manahśilā, Nepali, Śilavhā, Naipalika, Kanavirika, Nāgajihwika, Satwatmika, Divyau sadhi, Kunaṭī, Kulaṭi, Golā, Gouṇi, Karañji, Kalyāṇikā, Nāgamātā, Rasagandhaka, Rasanetrikā, Rogaśilā, Śilā, Manogupta, Manohwa, Manoghna.

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Availability

Manaḥśilā occurs with the ores of silver, lead and antimony and is usually associated with orpiment; it is also found as a sublimation product and as a deposit from hot springs. It is a product of an interaction of arsenic with sulphur vapours. It occurs in native form but is also prepared artificially.

Generally occurs in association with orpiment (*Haratāla*). It occurs as a deposite in not springs and as a volcanic sublimate. Available in Tuscany, Galicia, Spain, C.I.S. etc. Rarely available in India at Kumaun hill ranges.

Varieties

In almost all the texts its three varieties are mentioned based either on colour or form.

मनःशिला त्रिधा प्रोक्ता श्यामांगि कणवीरका । खण्डाख्या चेति तदूपं विविच्य परिकथ्यते ।। र.र.स. ३/८८

(a) Three types : 1. *Śyāmangi*
2. *Kaṇavīrika*
3. *Kaṇḍākya*

(b) Three types : 1. *Śyāmangi*
2. *Kaṇavīrika*
3. *Dwikhaṇḍa*

Śyāmāṅgi

श्यामा रक्ता सगौरा भाराढ्या श्यामिका मता ।। र. र. स. ३/८९

The *Śyāmṅgi variety of manahśilā* is light black, red, yellowish white and heavy. In *Āyurveda Prakāśa* it is described as follows :

श्यामा हिंगुलवद्रक्ता किंचित् पीताऽतिदीप्तिका ।। आ. प्र. २/२१६

It is red like *hiṅgula* with yellow tinge.

Kaṇavīraka

तेजस्विनी च निगौरा ताम्राभा कणवीरका । र. र. स. ३/८९

Kaṇvīraka is bright, divoid of *Goura Varṇa* and coppery in its look. *Āyurveda Prakāśa* says it is red in colour and available in powder form.

Khaṅḍākhya

चूर्णीभूताऽतिरक्तांगि सभारा खंडपूर्विका । र. स. स. ३/९०
किंचिद्रक्ता च गौरा च द्विखंडा भारवत्तरा ।। आ. प्र. २/१७

The *Khaṅḍākhya* variety is in powder form and deep red in colour, having weight. The other author says it is slightly reddish with yellow tinge and heavy.

Acceptable variety

Among these varieties *Śyāmāṅgī* is the best.

उत्तरोत्तरतः श्रेष्ठा भूरिसत्वा प्रकीर्तिताः ।। र. र. स. ३/९०

The *manaḥśilā* which is bright red like *Japāpuṣpa* is considered best for use in *Rasakarma*. In addition to above it should be heavy, bright and without stones and clay.

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Properties of purified and un-purified Manaḥśilā

अश्मरी मूत्रकृच्छ्रंच अशुद्धा कुरुते शिला । मन्दाग्निं मलबन्धं च शुद्धा सर्वरुजापहा ।। र.र.स. ३/९२

The *manaḥśilā* which is not purified causes *Aśmari, Mūtrakṛcra, Agnimandya* and *Vibandha.* But the one which is purified, overcomes all kinds of diseases.

Śodhana

अगस्त्यपत्रतोयेन भाविता सप्तवारकम् । शृंगवेर रसैर्वाऽपि विशुध्यति मनःशिला ।।
जयन्ती भृंगराजोत्थ रक्तागस्त्यरसैः शिलाम् । दोलायन्त्रे पचेद्यामं यामं छागोत्थमूत्रकैः ।
क्षालयेदारनालेन सर्वरोगेषु योजयेत् ।। र.र.स. ३/९३-९४

Manaḥśilā is purified by giving *Bhavānas* of either juice of *Agasthya* leaves or *Ardraka. Manaḥśilā* is first boiled in the juice of *Jayanthi, Bhringaraja* and red *Agasthya* leaves (either in individual juice separately or in the mixture of them) for one *prahara* (3 hours) and then in the urine of goat for one *prahara* (3 hours) in *Dolāyantra*. It is then washed well with *Kāñji*. The *Manaḥśilā,* thus purified is capable of curing all the diseases.

Satvapātana

अष्ठमांशेन किट्टेन गुडगुग्गुलुसर्पिषा । कोष्ठ्यां रुद्ध्वा दृढं ध्माता सत्त्वंमुञ्चेन्मनःशिला ।।
भूनागसत्त्वसौभाग्यमदनैश्च विमर्दितैः । कारवल्ली दलाम्भोभिर्मूषां कृत्वाऽत्र निक्षिपेत् ।।
शिलां क्षाराम्लनिष्पिष्टां प्रधमेत्तदनन्तरम् । घटीकाद्वयमात्रं हि ध्मानात्सत्त्वं सृजत्यसौ ।। र.र.स. ३/९५-९७

One part of *Manaḥśilā* and 1/8 each of *Maṇḍūra, jaggery, Guggulu* and ghee together ground well. The mass is then kept in crucible, which is placed inside the *Koṣṭhi* and blowed in the fire, intensively to obtain the *Satwa* of *Manaḥśilā.*

Equal quantities of *Manaḥśilā, Bhūnāga satwa* (*satwa* extracted from earthworm) and *Tankaṇa* are together ground in *Karavellaka* juice to prepare a crucible out of the resultant mass. The *Manaḥśilā* rubbed in *Kṣāra* (alkalies) and *Āmla* (sour) drugs, is kept in this crucible and subjected to intensive fire for two hours. This will yield the *Satwa* of *Manaḥśilā.*

Antidot

Sometimes purified, *Manaḥśilā* may produce some evil or toxic effects in the body which may be prevented by using 'cow's milk with honey' for 3 days or till the effects are not controlled. In otherwords it may be said that if cows milk is used with honey during the treatment with *Manaḥśilā* the changes of its toxic effects are minimised to the great extent i.e. it may not produce any toxic effects.

Pharmacological Properties

मनःशिला सर्वरसायनाग्र्या तिक्ता कटूष्णा कफवातहन्त्री ।
सत्त्वात्मिका भूतविषाग्निमान्द्य कण्डूतिकासक्षयहारिणी ।। र. र. स. ३/९१
मनःशिला गुरूर्वर्ण्या सरोष्णा लेखनी कटुः । तिक्ता स्निग्धा विषश्वासकासभूतकफास्त्रनुत् ।। अ.प्र. २/२१८

Rasa	:	*Tikta, Kaṭu*
Guṇa	:	*Snigdha, uṣṇa, guru, sara*
Vīrya	:	*Uṣṇa*
Karma	:	*Rasāyana, Lekhani, Viṣaghna, Śoṣini, Varṇakara, Bhutopadravanāśini.*
Effect on doṣa	:	*Kaphavātahara, Kaphaghni*

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Dose - 15-30 mg.

Therapeutic uses

Bhutāveśa, Viṣaroga, Agnimāndya, Kaṇḍu, Koṭha, Kṣaya, Kāsa, Śwāsa, Vātamaya, Sleṣmāmaya, Jwara, Kuṣṭharoga, Anāha, .

Formulations

Aghoranṛsinha Ras, Kālagnibhairava Ras, Kālanal Ras, Kulavadhu Ras, Kṛmikāṣṭānala Ras, Kṛmivināśan Ras, Kṛmihara Ras, Kṣayakesari Ras, Gadamurāri Ras, Trailokyacintāmaṇi Ras, Parṇakhaṇḍeśwara Ras, Bhaktavipāka Ras, Manaḥśilādi Ghṛta, Manaḥśilādya Varti, Mṛtasañjīvani, Mṛtotpan Ras, Rasraj Ras, Rasendra Guṭika (Bṛhad), Śleṣmakālanal Ras, Śwāsa Kuṭhāra Ras.

AÑJANA

Añjana is recommended to be applied to the eyes as a daily routin, which aimed not only to prevent deterioration but also to maintain prolong and improve the eye sight. The usual forms recommended are as *Collyrium* popularly known as *Surma. Añjana,* whereas, has five varieties, but they are entirely different substances, still categorised under *Añjana* because they are used as a topical application for the eyes. There is not any similarity in their chemical composition or properties otherwise, except *Srotoñjana* and *Souvirañjana,* which are both chemically antimony sulphide.

Surma, the basic material used in the Collyrium preparations is known in the arabic as *'Ismada, Ismida (Ibn-al Baitara), kuhl'* in the Persian as *Surma, Sange- Surma*, the Persian name being now current in the Indian languages also like *Surma, kala surma* (Hindi), *Surma* (Bengali, Marathi), *Surmi* (Gujrati) and the same is now all pervasive name in both, common usage and trade as well. The *Surma* of *Unani Hakims* is derived from *Galena* are ore of Lead which is chemically sulphide or sulphate of Lead as it is also supported by the identification of *Ismad* by the father, physician, Ibne- sina with *Unani Dravyaguṇadarśa. Unani* physicians have also mentioned another kind of *surma* under the epithet *Surma* also known as *Surma –e- Isphahani,* which is sometimes equated with the ancient *Srotoñjana & Sauvirañjana*. But chemically it is supposed to be the Sulphide ore of 'Antimony' and not of Lead (Galena). As the epithet Antimony etymologically itself suggests (Anti is very toxic, especially when ingested internally. Though the knowledge of pure Antimony metal is very large , but the ancient *Grīk* and Roman physicians knew.

Añjana is said to be compound of Antimony. *Añjana* is one of the oldest materials used in India and Asia, especially as a cosmetic for eyes. Even now, it is extensively used, specially by people of muslim community. In *Caraka* and *Suśruta samhitās,* different *Añjanās* have been refered to and used as medicine both internally and externally. However, it is for eyes, *Añjana* is prefered and the term is derived in that sense.

अंजनं क्रियते येन तद्रव्यं चांजनं स्मृतम् ।। र.सा.सं.

That, which is used for putting in to the eyes, is called *Añjana.*

Varieties

Classically, *Añjana* has been classified in five varieties.

सौवीराञ्जनं प्रोक्तं रसाञ्जनमतः परम् । स्रोतोऽञ्जनं तदन्यञ्च पुष्पाञ्जनमेव च ।
नीलाञ्जनं च तेषां हि स्वरूपमिह वर्ण्यते ।। (र.र.स. ३)

They are : 1. *Souvīrāñjana,* 2. *Srotoñjana,* 3. *Nīlañjana,* 4. *Puṣpāñjana,* 5. *Rasāñjana*

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Souvīrāñjana

The only description available about it's physical properties is it's colour.

सौवीरं तत्तु पांडुरम् । अथवा धूम्रवर्णाभं सौवीरमंजनमुच्यते ।। अ.प्र.

The *Souvīrāñjana* is *Dhumra,* according to *Rasaratna samuccaya* and *śweta* or *dhūmra* or *pāṅḍura,* according to *Āyurveda prakāśa.*

As a matter of fact the author of *Āyurveda prakāśa* claims that *Sovīrāñjana* is a variety of *Srotoñjana.*

Obviously both these *Añjana* are compounds of antimony

Pharmocological Properties

सौवीरमंजनं धूम्रं रक्तपित्तहरं हितम् । विषहिध्मादिरोगघ्नं व्रणशोधनरोपणम् ।। र.र.स. ३

Rasa	:	*Tikta, Kaṣāya, Kaṭu.*
Guṇa	:	*Hima, Snigdha, Śweta & Dhūmra.*
Vīrya	:	*Śīta.*
Vipāka	:	*Madhura*
Karma	:	*Vraṇa śodana & Ropaṇa, Dṛkprasādana, Sangrāhi, Vayasya, Netrya, Lekhana*
Effect on Doṣa	:	*Pittaghna, Tridoṣahara*

Therapeutic Uses

Raktapitta, Vami, Hikkā, Akṣiroga, Vraṇa, Kṣayaroya, Aśra (Rakta) roga, Karṇaroga, Viṣa, Netraroga.

Srotoñjana

वल्मीक शिखराकारं भंगे नीलोत्पलद्युति । घृष्टं तु गैरिकाच्छायं स्रोतोऽजं लक्षयेदध्रुवम् ।। र.र.स. ३

वल्मीकशिखराकारं भिन्नमंजन सन्निमम् । घृष्टं तु गैरिकाच्छायमेतत्स्रोतोंजनं स्मृतम् ।। आ. प्र. २

Srotoñjana is available in the form of anthill. The broken surface has the tinge of blue lotus. If it is rubbed (on streak plate), leaves reddish mark, resembling to the colour of *Gairika.*

As said earlier *Sourvīrāñjana* is a form of *Srotoñjana.*

स्रोतोंजनं द्विविधं प्रोक्तं श्वेतकृष्ण विभेदतः । यत्र स्रोतोंजनं कृष्णं सौवीरं श्वेतमीरितम् ।। आ. प्र. २

This variety of *Añjana* is sulphide of Antimony, which is otherwise called Stibnite.

Stibnite

Chemical composition : Sb_3S_3 (with 71.7% of antimony)

English	:	Antimony glance or grey Antiomony.
Crystal form	:	Orthorhombic, usually prismatic with pyramidal terminations.
Form	:	Elongated, bladed crystals. Occur in masses. Brittle, not elastic, opaque.
Colour	:	Lead gray, with blue tinge. Also silvery white.
Streak	:	Gray
Lustre	:	Metallic
Hardness	:	2.0

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Sp. Gr. : 4.5 to 4.6

Availability

Occurs in low temperature hydrothermal veins, associated with Realgar, Orpiment, Galena, Pyrite, Cinnabar and Quartz. It is available in UK, USA, North America, France, China and Japan. In India in Bihār, Karnātaka, A.P., Punjāb and Jammu. Stibnite is chief ore of Antimony. It is obvious that both *Srotoñjana* and *Souvīrāñjana* are *'Stibnite'*. As seen above stibnite is available both in lead gray colour and sometimes silvery white. Hence, the stibnite which is gray in colour is equated to *Srotonjaña,* which is said to be available in *'Dhūmra varṇa',* where as the stibnite available in white colour is obviously compared to *Souvīrāñjana.* Also compare the following features of classical *Añjana* with minerological description. *Valmīka Śikharākāram*-usually prismatic with Pyramidal terminations. *Nīlotpaladyuti*-lead gray with blue tinge. However, the streak has been mentioned as *'Gairikacchāya'* i.e. reddish in classical texts, it is actually gray.

Śodhana

अंजनानि विशुध्यंति भृंगराज दलद्रवैः ।। र.र.स. ३

All the *Añjanās* can be subjected to common *Śodhana* according to *Rasaratna samuccaya.* Though it is not clear how the *Śodhana* is performed with *Bhṛngarāja* juice, it is generally accepted that seven *bhāvanā* with this juice is carried out, for *śodhana.*

Specifically, *śodhana* of both *Srotoñjana* and *Souvīrāñjana* are carried out as follows :

त्रिफलावारिणा स्वेद्यं तदद्वयं शुद्धिमृच्छति । भृंगराजरसेवाऽपि स्रोतः सौवीरकं शुचि ।। आ. प्र. २

Both the *Añjana* can be made *Śuddha* by doing *Swedana* in decoction of *Triphalā* and juice of *Bhṛngarāja.*

Pharmocological Properties

स्रोतोंजनं स्मृतं स्वादुचक्षुष्यं कफपित्तनुत् । कषायं लेखनं स्निग्धं ग्राही छर्दि विषापहम् ।।
हिध्माक्षयास्रहृच्छीतं सौवीरमपि ताहशम् । द्वयोरंजनयोः किंतु श्रेष्ठं स्रोतोंजनं स्मृतम् ।। आ. प्र. २

Both *Srotoñjana* and *Souvīrāñjana* have similar properties, though *Srotoñjana* is preferred for medicinal usage. They are *Madhura* and *Kaṣāya* in *rasa; snigdha* and alleviates *Kapha* and *Pitta.* They do *lekhana karma* and are *grāhi.* They are useful in *Chardi, Viṣavikāra, Hikkā, Kṣaya, Raktapitta.*

स्रोतोंजनं हिमं स्निग्धं कषायं स्वादुलेखनम् । नेत्र्यं हिध्माविषच्छर्दि कफपित्तास्रोगनुत् ।। र.र.स. ३

As it is obvious, the properties of *Srotoñjana* are also similar to those of *Souvīrāñjana* as described above.

Nīlāñjana

विद्यान्नीलांजनं गुरु ।। र.र.स. २
नीलांजनं स्मृतं नीलवर्णं स्निग्धंच भारवत् ।। आ.प्र. २
नीलांजन गुरु स्निग्धं.....।। र.र.स. ३

Nīlāñjana, according to above description is *guru, snigdha* and has *Nīla* (blue) colour. Though the information regarding it's identification is meagre *Nīlāñjana* is considered as lead compound i.e. lead sulphide, which is called Galena.

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Galena

Galena is also known as lead glance, and blue lead.

Chemical composition	:	PbS
Crystal form	:	Cubic
Colour	:	Lead gray with blue tinge.
Streak	:	Lead gray
Lustre	:	Metallic on fresh surface but dull when exposed.
Hardness	:	2.5
Sp. Gr.	:	7.4 to 7.6

Availability

Often occurs with sphalerite (Zinc sulphide). Available in Mynmar, U.S.A., Australia, New mexico, U.K. In India deposits of galena are situated in Rajasthan, Bihar, Tamilnadu, A.P. J&K., M.P. etc. Galena is important ore of lead. Infact Indians were the pioneers in obtaining the metallic lead from Galena, in the earlier days.

Śodhana

नीलांजनं चूर्णयित्वा जंबीररसभावितम् । दिनैकमातपे शुद्धं भवेत्कार्येषु योजयेत् ।। आ. प्र. २

The powdered *Nīlāñjana* is given the *bhāvanā* in the juice of *Jambīra* and dried under the sun for a whole day.

Pharmacological Properties

नीलांजनं गुरुस्निग्धं नेत्र्यं दोषत्रयापहम् । रसायनं सुवर्णघ्न लोहमार्दवकारकम् ।। र.र.स. ३

Nīlāñjana is *guru, snigdha* and good for eyes. It alleviates all the three *doṣa* and is a *Rasāyana.* It is useful in the *mārana* of *swarṇa* and in softening of the metals.

Puṣpānjana

पुष्पांजनं सितं चैव । पुष्पांजनं रीतिकिट्टमिति केचिद्वदंति हि ।। आ.प्र. २

Puṣpāñjana is white in colour. According to some, it is *Rītikiṭṭa.* As a matter of fact, *Puṣpāñjana* is also a material, the identification of which is not definite. There are many controversies, even in the classical texts, which is evident from *Āyurveda prakāśa.* The commentator of *Rasaratna Samuccaya,* Dr. D.A. Kulkarni explains the different opinions as follows :

As the name indicates, it may be an *Añjana* derived from the *Puṣpa*-flower. It may be the nectar obtained from a flower, available in *Kāshmir,* which is called *'Kāshmiri madhu'*. This is used as *Añjana* (collyrium). There is one reference in *Atreya Saṁhitā,* which speaks of *Makaranda* (nectar) from *Kamala Puṣpa* (lotus), which is called *'Padma madhu'*.

अरविंद हृतः शीतो मकरंदोऽति बृंहणः । त्रिदोषशमनः सर्व नेत्रायम निशूदनः ।। आत्रेय संहिता

Hence the nectar derived from lotus too can be *Puṣpāñjana. Puṣpa Kāsīsa* can also be considered as *Puṣpāñjana. Puṣpakāsīsa* is also called *nayanouṣadha* and *netrouṣadha,* indicating it's uses ins eye diseases. The *swarūpa* also resembles the *Puṣpāñjana.*

द्वितीयं पुष्पकासीसमितं च सितं च तत् । तदेव किंचित् पीतं पुष्पकासीमुच्यते ।।

Puṣpakāsīsa is also said be good for eyes. Hence *Puṣpakāsīsa* can also be taken as *Puṣpāñjana.*

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According *Āyurveda prakāśa, 'Ritikiṭṭa'* is *Puṣpāñjana. 'Rīti'* is *pittala* i.e. brass. it is an alloy of copper and zinc. Some compounds of copper, like copper sulphate is useful in eye diseases. Zinc, as a matter of fact directly relates to the *Puṣpāñjana,* as seen later. Hence the alloy of these two, *Riti* or *pittala* or it's *Kiṭṭa* (probably obtained by frying the *pittala*) is said to be *puṣpāñjana.*

The roasted *'Sphaṭika'* or alum which is called *'sphaṭika lājā'* is also considered as *puṣpāñjana.* This *lājā* is used in the treatment of eye disorders. It is white in colour. Apart from these opinions, many claim that *puṣpāñjana* can also be 'Oxide of Zinc'. *Dr. Siddhinandan Misra*, explains its preparation in his *Āyurvediya Rasaśāstra.* Zinc is roasted in an iron pan in the open air. It melts at 419^{0}C and boils at 930 ^{0}C. Later it turns to puffy substance, which is considered as *puṣpāñjana.* As a matter of fact zinc oxide is available naturally, which is called Zincite. However it is considered as *Rasaka.*

However, it is difficult to identify a single material as *puṣpāñjana,* taking the above discussion into consideration. If nectar of a flower is excluded, as it is not a mineral, *puṣpāñjana* could be either dehydrated ferrous sulphate or dehydrate alum of zinc oxide.

Śodhana

No specific śodhana has been indicated for *Puṣpāñjana* in the texts. Hence general *śodhana* i.e. *bhāvanā* with juice of *Bhṛṅgarāja* is carried out.

Pharmocological Properties

पुष्पांजनं सितं स्निग्धं हिमं सर्वाक्षिरोगनुत् । अतिदुर्धरहिध्माघ्नं विषज्वरगदापहम् ।। र.र.स. ३

Puṣpāñjana is *snigdha* and *śīta.* Useful in all kinds of diseases of the eyes. It eradicates severe *Hikkā, Viṣavikāra* and *Jwara.*

Rasāñjana

There is lot of controversy about the indentification of *Rasañjana.* it is derived from *Dāruharidrā* plant; according to *Āyurveda prakāśa.*

दार्वीक्वाथमजाक्षीरपादपक्वं यदा घनम् । तदा रसान्जनं ख्यातं नेत्रयोः परमं हितम् ।। आ.प्र. २/२३४

Dāruharidrā kwātha is mixed with $^1/_4$ quantitiy of goats milk and heated untill it solidifies. This is called *Rasāñjana.* Most of the authors advise similar preparation, in the name of *Rasāñjana,* though there is a slight difference as far as milk is concerned. Some advise to add *Ajākṣīra* (goats milk), where as some other indicate the *Gokṣīra* (cows milk). *Dalhaṇa,* while commenting upon the *'Rasāñjana'* referred by *Suśruta* says that *'Rasāñjana'* prepared by *Dāruharidrā kwātha* is artificial.

रसांजनं दारुहरिद्राक्वाथेन कृत्रिमम् ।

He further claims

'अन्य त्वेवं वदंति रसांजनं द्विविधम् स्रोतोंजं कृष्णपाषाणाकृति धातुद्रव्यम् । अन्यद्दारुहरिद्रा क्वाथेन कृत्रिमम् ।।'

Rasāñjana is of two kinds, one is that which is *srotoñjana* resembling the *kāntapāṣāṇa* and another is that, prepared by *Dāruharidrā* which is artificial. This statement makes it more confusing as, this brings a new material into picture. However, in some other contexts, while enumerating the *Priyaṅgwādi Gaṇa, Suśruta* himself quotes both *Rasāñjana* and *srotoñjana,* thus accepting them as two different materials. Some commentators claim that *Rasāñjana* can not be *'Dāruharidrā Rasakriyā'* as it is derived from a plant substance. A plant material can not be accepted as *'Rasadravya'*. Hence it should be a mineral substance. According to Dr. D.A. Kulkarni and Dr. V.G. Desai, it should be considered as a derivative of *Rasa-mercury.* They claim that it is related to *Rasa*, as it has synonyms

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like *Rasagarbha, Rasāgraja, Rasodbhava, Agnisāra etc,* and specifically it may be yellow oxide of mercury. As a mater of fact, yellow oxide of mercury is used in eye disorders.

Śodhana

सूर्यावर्तादियोगेन शुद्धिमेति रसांजनम् ।। र.र.स. ३

For the *Śodhana* of *Rasāñjana, 'Sūryāvartādi yoga'*, is used. Preferably 3 *bhāvanā* of its decotion is given. *Sūryāvartādi yoga* or group of herbs which belongs to this *yoga* is described as follows :

सूर्यावर्तकदली बंध्याकोषातकी च सुरदाली । शिग्रुश्च वज्रकंदा नीरकणा काकमाची च ।। र.र.स. ३

Śūryāvarta, Kadali, Vandhyā, Koṣātaki, Devadāli, Śigru, Vajrakanda, Jalapippali and *Kakamāci* are the herbs belonging to this group.

Pharmocological Properties

रसांजनं पीताभं विषवक्रगदापहम् । श्वासहिध्मापहं वर्ण्यं वातपित्तास्रनाशनम् ।। र.र.स. ३

Rasāñjana is useful in *Viṣavikāra, Mukharoga, Śwāsa,* and *Hikkā.* It enhances the complexion of the body and eradicates *Vātarakta* and *Raktapitta.*

तदा रसांजनं ख्यातं नेत्रयोः परमं हितम् ।। आ.प्र. २

Rasāñjana is said to be best for the eyes and diseases of the eyes.

Śodhana of all Añjana

नीलाञ्जनं चूर्णयित्वा जम्बीरद्रवभावितम् । दिनैकमातपे शुद्धं ततः कार्येषु योजयेत् ।। र.स.सं. २२५

अन्जनानि विशुद्धयन्तिमत भृङ्गराजनिजद्रवैः । सूर्यावर्त्तादियोगेन शुद्धिमेति रसांजंनम् ।। र.र.स. ३/१०

त्रिफलावारिणी स्वेद्यं तद्द्वयं शुद्धिमृच्छति । भृङ्गराजसे वाऽपि स्त्रोतः सौवीरकं शुचिः ।। आ.प्र. २/२३२

All types of *Añjanas* are purified by giveng *bhāvana* of juice of *Bhṛingarāja. Rasāñjana* can be purified with the help of a *Sūryavartadi yoga, Kadali Vandhya, Kośātaki, Suradali, Śigru, Vajrakanda Nīrakaṇa and Kākmaci.*

Añjana is powdered and given the *Bhāvanā* with the juice of *Jambīra.* Then, it is dried for a day in sunshine. Such *Śuddha Añjana* can be used in various operations.

Satvapātana of all Añjana

मनोह्वा सत्ववत्सत्त्वमंजनानां समाहरेत् । राजावर्तवत्सत्वं ग्राह्यं स्त्रोतोंऽजनादपि ।। र.र.स. ३

Satvapātana of *Añjanās,* is similar to that of *Manaḥśila. Añjanā* one part and $^1/_8$th each of *Guḍa. Gaggulu, Maṅḍūra* and *Ghṛta* are taken together and ground to make a ball, which is subjected to heat in *Koṣṭhi,* to obtain *satva.* Similar procedure can be adopted to obtain *satva* of *Añjanās.* However, *satva* can be obtained from only *Srotoñjana, Souvīrāñjana* and *Nīlañjana. Srotoñjana Satvapātana* is said to be similar to that of *Rājāvarta,* which is as follows : *Srotoñjanā* and *Manaḥśila* are taken in equal quantity and rubbed with *Ghṛta.* It is then cooked with buffalo's milk in an iron vessel to a semisolid consistency. Then, *Ṭaṅkaṇa* and *Pañcagavya* (cow's milk, ghee, curd, urine and dung) are added to it, cooked again. This material is made in to a ball and heated in the fire, made of *Khadira* wood to obtain *satva.* To obtain *satva* from *Srotoñjana,* similar process is carried out. Probably, Antimony in the form of metal, is obtained by this.

Dose : There is no specific mention of dosage of individual *Añjana* as such, in the classical texts. It seems, vaidyas rarely use these *Añjanas* individually, internally, except for *Añjana* purpose (i.e. to

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put in to the eyes). However, these are used in the preparation of some yoga like *Pīyūṣavalli Rasa, Bhūtāṅkuṣa Rasa, Caṇḍabhairava Rasa, Vaḍavānala Rasa, Vatāri Rasa* etc.

KANKUṢṬHA

There are different references in *Āyurvedic* texts, including different substances under the same name *Kankuṣṭha*.

केचिद्वदन्ति कंकुष्ठं सद्योजातस्य दान्तिनः। वर्चश्च श्यामपीतभं रेचनं परिकथ्यते ।।
कतिचित्तेजिवाहानां नालं कंकुष्ठसंज्ञकम् । वदन्ति श्वेतपीताभं तदतीव विरेचनम् ।
रसे रसायने श्रेष्ठं निःसत्त्वं बहु वैकृतम् ।। र.र.स. ३/१११-११२

In *Rasa ratna samuchchaya* even different opinions of ancient scholars are mentioned.

It is mentioned to be the faeces of newly born elephant. It is blackish yellow in colour and has a strong purgative property. Another opinion about *Kankuṣṭha* is that it is the umbilical cord of a newly born horse. It is whitish-yellow in colour and has purgative as well as rejuvenating properties. According to *Ācārya Dalhaṇa, Kankuṣṭha* is the herb – *Swarṇakṣiri* (Argemone mexicana), which has yellow flowers. According to some scholars, *Mṛḍḍāraśriṅga* (Litharge), means *Kankuṣṭha*. It is yellow in colour and heavy. *Suśruta* has mentioned about the roots of *Kankuṣṭha* and categorized it under purgative herbs. Thus according to him it seems to be a plant. *Dalhaṇa*, the critic of *Suśruta* mentions *Kankuṣṭha* to be *Revāndacīni* (Rheum emodi) i.e. *Pitamūla*. According to few scholars, *Kankuṣṭha* is a resin obtained from the Mysore gambose tree, which occurs in Tamilnadu. The resin is yellow in colour and a strong purgative.

About *Kankuṣṭha*, the reference from ancient texts mentioned, are as follows: *Kankuṣṭha* is found in the peaks of *Himalaya*. It is yellow in colour, bitter and pungent in the taste, unctuous and heavy to digest. *Kankuṣṭha* is strong purgative, with very little dosage i.e. 50-60 mg, it cause catharsis.

From the various thoughts about *Kankuṣṭha*, mentioned above, it is difficult to derive the final decision about what precisely *Kankuṣṭha* should be. Though it is said that the faeces of a newly born elephant and umbilical cord of a newly born horse, both have a *purgative* property, it is not in practice to use these substances as a *purgative* and not also proved. So these two substances cannot be called as *Kankuṣṭha*. Similarly, the two varieties, viz. *Nalika* and *Renuka* are not *purgatives*, hence can be discarded. The root of a herb *Swarṇakṣīrī* (Argemone mexicana) is supposed to be as *Kankuṣṭha*, but the latex and not the root, of this plant is purgative. Morever, the latex is white in colour, and not yellow. Thus it also cannot be called as *Kankuṣṭha*. *Mṛddaraśṛṅga* is categorized under *Sadharaṇa rasa*, and is the *upadhātu* of lead. From its extraction, lead can be obtained. So it cannot be *Kankuṣṭha*. The plant *Pitamūla* (*Revandacīni*), (i.e. *Rheum emodi*) has the roots yellow in colour, but it has a mild laxative (not strong purgative) property. So it is not correct to call it as *Kankuṣṭha*. The resin collected from the bark of Mysore Gmbose Tree, gets a rod like shape (*nalika*) and when resin is in liquid state, it contains yellowish black flakes (*renuka*)..Hence, this resin consists of both the forms i.e. *Nalika* and *Renuka*, as mentioned in the texts. Morever, it is a strong *purgative*. Only it is not found in *Himalaya*. Thus it can be suitable called as *Kankuṣṭha*. Thus to derive at conclusion, it can be said that the resin of Mysore Gambose Tree, or at the most, the root of *Pitamūla* (Rheum emodi) can be said as *Kankuṣṭha*. But the faeces of newly born elephant, umbilical cord of newly born horse, root of Swarṇakṣiī and *Mṛddāraśṛṅga* cannot be called as *Kankuṣṭha*. There is no mention about purification, incineration or extraction of *Kankuṣṭha* in the texts.

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Synonyms

Kankuṣṭha, Kāka Kankuṣṭha, Varanga, Virang, Kolavaluka, Talakuṣṭa, Tikṣṇa dugdhika, Suvarnakṣiri Niryasa, Rechaka, Rangadāyak, Śodhan, Hemavati.

Varities

There are two varieties of *Kankuṣṭha*, viz. *Nalika* and *Reṇuka*. *Nalika* is yellow, heavy and unctuous. It is used as medicine. *Renuka* is blackish-yellow, light.

Śodhana

कंकुष्ठं शुद्धिमायाति त्रिधा शुण्ठ्यम्बुभावितम् । सत्त्वाकर्षोऽस्य न प्रोक्तो यस्मात्सत्त्वमयं हि तत् ।।

र.र.स. ३/११४

Kankuṣṭha is purified by giving *bhāvana* of decoction of śuṇṭhi. The *astringent* property of dry ginger reduces the *purgative* property of *Kankuṣṭha*. As *Kankuṣṭha* is itself, in the from of *satwa*, there is no necessity of extracting *satwa* from it.

Phormocological Properties

कंकुष्ठं तिक्तकटुकं वीर्योष्णं चातिरेचनम् । व्रणोदावर्त शूलतिगुल्मफिहगुदार्तिनुत् ।। र.र.स. २/११३

Rasa	:	*Tikta, Kaṭu*
Vīrya	:	*Uṣṇa*
Karma	:	*Atirecana* (drastic purgative)

Administration

भजेदेनं विरेकार्थं ग्राहिभिर्यवमात्रया। नाशयेदामजार्ति च विरेच्य क्षणमात्रतः।।

भक्षितः सह ताम्बूलैर्विरिच्यासून्विनाशयेत् ।।

बब्बूलीमूलिकाक्वाथो जीरसौभाग्यकं समम् । कंकुष्ठविषनाशाय भूयो भूयः पिबेन्नरः ।। र.र.स. ३/११५-११७

Kankuṣṭha is given in the dosage of one *Yava* (1/4 *ratti* - about 30 mg) along with the *Grahi* (binding) drugs (like *śuṇṭhi, jīraka* etc.) for causing *virecana* (purgetion). If *Kankuṣṭha* is consumed before or along with *Tambūla* (betel leaf) due to drastic purgetion, the patient may suffer extremely. When there are poisoning effects of *Kankuṣṭha* (like drastic purgation), the decoction of Babbula root is consumed frequently, along with *Jīraka* and *Tankaṇa*.

Therapeutic Uses

Vraṇa, Udavartha, Plīharoga and Arśa

Formulations

Udavartahar Ghṛta, Jyotiṣman Ras, Dhanwantari Ghṛta, Dhanwantari Ras, Mṛtsañjīvanī Ras, Śothodarari (Ras) Lauha.

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Chapter 8

SĀDHĀRAṆ RASA

कंपिल्लश्चापरो गौरीपाषाणो नवसादरः । कपर्दो वान्हिजारश्च गिरिसिन्दरहिङ्गुलौ ।।
मृद्दारशृंगमित्यष्टौ साधारण रसाः स्मृताः । रससिद्धिकराः प्रोक्ता नागार्जुनपुरस्सरैः ।। (र.र.स. ३/१२०-१२१)

In this group the minerals of ordinary utility to *Rasa* (mercury) have been included. *Kampillaka, gaurīpāṣāṇa, navasādara, kapardika, agnijāra, girisindūra, hiṅgula* and *mṛddāraśṛṅga* are the eight drugs of the *sādhāraṇa rasa* group. These are claimed to be useful for producing *siddhi* (success) in *rasakarmas* by scholars like *Nāgārjuna* and others. The drugs of *Sādhāraṇa Rasa* group mentioned in different texts are mentioned below :

Sl.	*Name of the drug*	*Name of the Text*			
		Rasendra Cūḍāmani	*Rasa Prakāśa. Sudhākara*	*Rasa Ratna. Samuccaya*	*Āyurvedā Prakāśa*
1.	*Kampillaka*	+	-	+	+
2.	*Gaurīpāṣāṇa*	+	-	+	+
3.	*Navasādara*	+	+	+	+
4.	*Kaparda/Varāṭa*	+	+	+	+
5.	*Agnijāra*	+	+	+	+
6.	*Girisindūra*	+	+	+	+
7.	*Hiṅgula*	+	+	+	-
8.	*Mṛddāraśṛṅga*	+	+	+	-
9.	*Capala*	-	-	-	+

It is evident from this table that *Rasa Prakasa Sudhākara* included only six drugs in this group by excluding *kampillaka, gaurīpāṣāṇa* and *capala. Āyurveda Prakāśa* enumerated seven drugs in this group, *hiṅgula* and *mṛddaraśṛṅga having* been excluded and *capala* being included.

KAMPILLAKA

Kampillaka consists of glands and hairs *(Phalaraja)* of fruit of Mallotus Philippensis Muell. Arg. Fam. Euphorbiaceae i.e. powder covering the fruits of this plant. It will be in brick red or reddish yellow powder form. The most important active constituent is a Reddish Yellow (Laminar Plates) resin composed of a crystalline substance called rottlerin. *Kampillaka* is known to Indians since the *Saṁhitā* period. In *Caraka saṁhitā, Suśruta saṁhitā and Vāghbhaṭa, Kampillaka* is mentioned in many places for therapeutic purposes.

Śānskṛt	-	Kampillaka, Kapila, Recanaka
Varga / Gaṇa	-	Sādhāraṇa Rasa Varga, Virecana, Phalinidravya (Caraka), Adhobhāgahara, Śyāmadi (Suśruta)
Hindi	-	Kamala, Kabila, Kamila, Kambila, Kapila, Śinduri etc.
Trade Name	-	Kabila, Kamila
English	-	Indian Kamala, Rottalera, Monkey face tree

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Latin Name - Mallotus philippensis Muell – Arg
Family - Ephorbiaceae

Synonims

इष्टिकाचूर्णसंकाशश्चन्द्रिकाढ्योऽतिरेचनः । शौराष्ट्रदेशे चोत्पन्नः स हि कम्पिल्लकः स्मृतः ।।

(र.र. सम. ३/१२२)

Kampilla, Karkaśa, Candra, Raktānga, Rocana, Kampila, Reci, Raktacūrṇaka, Kampillak, Recana, Lohitānga, Kampilya, Lohita, Nadivāso, Raktaphala, Bahupatra. Bahuphalah, Pikākśa, Rocani, Laghu–Patrāka, Bahupuṣpa. Ranjanaka, Rakta śamana, Vraṇa śodhana, Recanaka.

Availability

It is a very common perennial shrub or small tree found in Himalayan region and is distributed over the whole India (Orissa, Bengal, U.P., Uttaranchal, Gujarat etc). The plant remains green throughout the year. Fruits are small, round and on ripening become covered with a reddish powder, the phalaraja which when collected is known as *Kampillaka.*

Parts used	:	Glands and hairs (*Phalaraja* from the capsules or fruits).
Flowering period	:	October to November
Kampillaka	:	Its fruit is trilobed capsule. *Phalaraja* (Red-hairy glands like Par ticles) are covered. Its seeds are round and black in colour.
Fruiting Time	:	February to March
Phalaraja	:	Over the ripened fruits, red colour secretion will solidify in colour granule form and this phalaraja is collected by the name of kabila
Kabila collection period	:	February to March from mature fruits.
Method of *Kampillaka* Collection	:	Mature fruits of *Kampillaka* are collected in a mesh, by rubbing and shaking, phalaraja is filtered and collected.
Preservation	:	Collected *Kampillaka* is to be preserved in air tight container.

Śodhana

Ingredients

1. Kampillaka	-	*1 Part*
2 Mātulungarasa or Nimburasa	-	*Q.S.*
3. Ārdrakarasa	-	*Q.S.*

Method : Kampillaka which is cleaned with water and dried. Then it is collected in required quantity. *Bhāvana* is given for *kampillaka* three times with each *drava* (*Mātulungarasa* or *Nimburasa* and *Ārdraka rasa*), then dried and collected *kampillaka* is used as a medicine by the name of *śuddha kampillaka.*

Physico-chemical characters of Kampillaka (Crude form)

1. Colour	Brick Red
2. Appearance	Powder
3. Rubbing Over white Paper	Yellow Colour Mark
4. Moisture content	2.30% w/w

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5. Total ash	6.49%w/w
6. Water soluble extractive	2.83% w/w
7. Dilute Acid Soluble extractive	7.055% w/w
8. Foreign Matter	1.49% w/w
9. Acid Insoluble Matter	92.95% w/w

Physico–chemical characters of Suddha Kampillaka

1. Colour	Brick Red
2. Appearance	Powder form
3. Moisture content	4.72% w/w
4 Total ash	6.87%w/w
5. Water Solube Extractive	4.1%w/w
6. Dilute Acid Soluble extractive	10.20% w/w
7. Foreign Matter	1.99% w/w
8. Acid Insoluble Matter	89.80% w/w

Pharmacological Properties

Rasa _ *Kaṭu*
Guṇa - *Laghu, Rūkṣa, Tīkṣana*
Virya - *Uṣṇa*
Vipaka - *Kaṭu*
Karma - *Virecana, Kaphahara, Vraṇāpaha, Kṛmighna, Pittahara*

Dose : 0.5gm. to 1 gm.

Anupāna : Hot *Water, Madhu, Ghṛta, Taila, Dadhi, Takra etc.*

Therapeutic Uses

पित्तंव्रणाध्मानविबन्धहारी श्लेष्मोदरार्त्तिक्रिमिगुल्महारी। मूलामशीफज्वरशूलहारी कम्पिल्लको रेच्मगदापहारी।।
(र.र. समु. ३/१२३)

कम्पिल्लको विरेकी स्यात्कटूष्णो व्रणनाशनः । कफकासार्तिहारी च जन्तुक्रिमिहरी लघुः ।।
(आ. प्रकाश २/३५)

Kṛmighna, twakroga, vraṇa ādhmana, vibhandha, udara roga, gulma, arśa śotha, jwara śūla, kapharoga and the diseases which are curable by purgation (*virecana*).

Formulations

Kṛmighni Vaṭika, Kampillak Cūrṇa, Triphalādya Ghṛta, Brahmghṛta, Bindu Ghṛta, Dūrvadya Taila – Ghṛta, Nīlini Ghṛta, Kuṣṭādya Taila, Paṭolādi Cūrṇa, Kanakakṣīra taila, śyāmādi cūrṇa, vipādika hara taila, kampillādi cūrṇa, viḍangādi cūrṇa, kāsisādi ghṛta, Dhanvantara ghṛta, miśraka sneha etc.

GAURĪPĀṢĀṆA

Gaurīpāṣāṇa is a mineral *sādhāraṇa rasa* group and is known as white arsenic. On fresh fracture it looks opaque and tin white but on exposure it turnes into dark grey to black. Native arsenic often

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contains antimony as well as bismuth, cobalt, nickel, silver, iron, or gold. Crystals are hexagonal or psuedocubical, occurs in compact, scaly, granular or fine-grained masses, often breaks into onion like layers, found principally in the veins of rocks with silver, cobalt, and nickel. As *gaurīpāṣāna* is found in association with sulphur, iron, or copper its ores are roasted in furnace and the arsenic content mixed with oxygen gets accumulated in the pipes and is collected from there. According to texts, it is obtained from two sources, *viz.*, mountains or minerals, *i.e.* it is *parvata sambhava (khanija)* and artificially made, *tāla sambhava (kṛtrima). Gaurīpāṣāṇa* is crystalline or amorphous substance. Its powder resembles the flour of wheat but is much heavier. The surface of *Gaurīpāṣāṇa* has a peculiar shine and sometimes there occurs a yellowish tinge, which is due to impurities it contains. Sometimes, the articles made up of China clay or tiles are mixed with *Gaurīpāṣāṇa*, as an adulterant material. But the shining surface of *Gaurīpāṣāṇa* distinguishes between them.

Śānskṛt	:	*Gaurīpāṣāṇa*
English	:	Arsenic Oxide, Vitrious arsenic, Arsenolite, White Arsenic
Hindi	:	*Śankhiya*
Chemical Formula	:	As_2O_3
Hardness	:	3 to 4
SP. Gr.	:	5.6 to 5.8

Synonyms

गौरीपाषाणकः पीतो विकटो हतचूर्णकः । (र. र. स. ३/१२४)

Gaurīpāṣāṇa, Śankhaviṣa, Mūṣaka, Akhupāṣana, somala, Phenaśmabhasma, Pīta, Vikaṭa, Haṭacūrṇaka.

Malla is commonly known as *somala.*

Availability

It is often found with sulphur, Iron or copper hence the ores containing sulphur, Iron and Copper when roasted in furnace, the arsenic content mixed with oxygen is found accumulated in the pipes and collected from there.

Its origin according to *Āyurveda* texts *1. Parvatsambhava, 2. Kṛtrima (Tālasambhūta)*

Varieties

स्फटिकाभश्च शंखाभो हरिद्राभस्त्रयः स्मृताः।। पूर्वः पूर्वो गुणैः श्रेष्ठः । (र. र. स. ३/१२४)
गौरीपाषाणकः प्रोक्तो द्विविधः श्वेतपीतकः । श्वेतः शंखसदृक्पीतो दाडिमाभः प्रकीर्तितः ।।
श्वेत कृत्रिमकः प्रोक्तः पीतः पर्वतसम्भवः । विषकृत्यकरौ तौ हि रसकर्मणि पूजितौ।। (आयु. प्र. २/३३७)
मल्लस्तु द्विविधः प्रोक्तः श्वेतोऽन्यो रक्तकस्तथा। कृत्रिमः श्वेतमल्लस्तु रक्तश्चाकरसम्भवः ।।
(रसतर० ११/१३२)

Three varieties of *Gaurīpāṣāṇa* are mentioned in *Āyurvedic* texts, viz. *Sphatikabha, Śaṅkhābha* and *Pītābha.*

1. *Sphaṭikābha :* Resembles to rock crystal, is transparent and white .
2. *Śankhābha :* It is amorphous, white but opaque.
3. *Haridrābha :* This is yellow in colour. It is also known as *Pītābha*, meaning having a colour like turmeric.

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Acceptable variety

Amongst all varieties, *Sphaṭikābha* is the best. *Sphaṭikābha* is better than *Śankhabha* and *Śankhabha* is better than *Haridrābha*.

Modern varieties

1. Amorphous and 2. Crystalline.

The crystals are octohedral or monoclinic. Amorphous variety resembles to Āyurvedic varieties named *śankhābha* and *haridrabha*.

Śodhana

स्वेदयेद्धण्डिकामध्ये शुद्धो भवति मूषकः गौरीपाषाणकं श्रेष्ठं कारवेल्लीफले क्षिपेत् । (र.र.स. ३/१२५)
गवां दुग्धेऽथवा त्वाजे कारवेल्लीरसेऽथवा । द्वियामं स्वेदितः शुद्धो गौरीपाषाणको भवेत् ।। (रसामृतम्)
विपाचितं शंखविषं यत्नतुष्ठङ्कणाम्भसा। गव्यदुग्धेन चा यामं शुद्धिमायात्यनुत्तमाम् ।।
कारवेल्लीरसेनेह ढोलायन्त्रे द्वियामकम् । विपाचितं शङ्खविषं शुद्धिमायात्यनुत्तमाम् ।। (रसतर. ११/१३६)

Gaurīpāṣāṇa is purified by heating it in cow's milk by *dolāyantra* method. It is also purified by closing it in *kāravallīphala (*bitter gourd) or *sūraṇa kanda* and then subjected to *svedana.* The pieces of the best variety of *Gaurīpāṣāṇa* are placed in side the *kāravallīphala*, and the hollow portion is filled up.Then *kāravallīphala* is steamed in a pot, which is filled with water or juice of the fruit. Then *Kāravelli Phala* is allowed for *śwedana* in this pot. In the above procedure, sometimes, the bitter gourd fruit filled with the pieces of *Gaurīpāṣāṇa* is wrapped in the form of *Poṭṭali* and the *Poṭṭali* is subjected to steaming in *ḍola yantra* for three hours. It is also mentioned that the juice of bitter gourd is to be kept in *ḍola yantra.*

There are few other procedures mentioned, wherein the steaming of bitter gourd (filled with pieces of *Gaurīpāṣāṇa* is done in borax water *(tankaṇa jala)* or cow's milk *(godugdha)*, with the help of *dola yantra*. It can be also steamed in shegoat's milk or flesh juice in *ḍola yantra*, for one day. The cow's milk and borax water detoxify the *Gaurīpāṣāṇa.*

Satvapātana

तालवद् ग्राहयेत्सत्त्वं शुद्धं शुभ्रं प्रयोजयेत् । (र.र. स. ३/१२६)

Extraction of *Gaurīpāṣāṇa* is done by a procedure, similar to that used for extracting *Haratāla.*

Properties

1. When heated, *somal* becomes soft and emits the odour like garlic.
2. One crystalline variety of *somal* is soluble in water, in very small quantity.
3. The crystals of arsenic oxide are octahedral or monoclinic, of which the later are unstable.
4. When heated with intense heat, it evaporates in the atmosphere, directly (sublimation), giving out garlic odour.

Pharmacological Properties

गौरीपाषाणकः शुद्धो मात्रया परिशीलितः। कफवातामयहरो बल्यो वृष्यो रसायनः।।
श्वासं शीतज्वरं पाण्डुं प्लीहवृद्धिं फिरङ्गकम् । श्लीपदं सन्धिवातं च तथा कुष्ठानि नाशयेत् ।। (रसामृतम्)
रसबन्धकरः स्निग्धो दोषघ्नो रसवीर्यकृत् । (र.र.स. ३/१२६)

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खनेत्रेन्दुमितात् भागाद् रक्तेरारभ्य यत्नतः। खवह्निभागप्रमितं शङ्खभूषं नियोजयेत् ।। (रसतर० ११/१४५)
गुञ्जोन्मितं शंखविषं तिथिमाषकसम्मिते । मरीचचूर्णे निक्षिप्य शृङ्गवेराम्भसा ततः।।
खल्वमध्ये निधायाथ मर्दयेत्तु दिनत्रयम् । निर्मापयेत्ततो युक्तया वटिका रक्तिकोन्मिताः ।।
एकैकां वटिकाञ्चाथ सायम्प्रातस्ततो भिषक् । वीतशङ्कः प्रयुञ्जीत तत्तद्दोषापनुत्तये ।।
अनेनैव तु मानेन प्रयोगोद्दिष्टभेषजैः। एतत्सम्मेल्य निर्माय वटिकादीन् प्रयोजयेत् ।। (रसतरं. ११/१५०)
आरभ्य दशमांशात्तु सर्षपस्य प्रयत्नतः।। (रसतरं० ११/१४६)
रक्तिसम्मितमल्लस्य भक्षणात् पुरुषो यतः। यमालयं प्रयातीह सावधानतया ततः ।। (रसतरं० ११/१५१)

Rasa - *Tikta*
Guṇa - *Rūkṣa, Snigdha.*
Karma - *Kledana, Doṣaghna, Viṣatulya, Rasabandhakara Rasavīryakara.*
Doṣaprabhāva - *Tridoṣaghna.*

Therapeutic Uses

Śotha, Gulma, Pāṇḍu, Udara roga, Sarvaroga.

Other Uses

Gaurīpāṣāṇa is useful for *bandhana* of *Pārada* i.e. stability. *Gaurīpāṣāṇa* augments the potency of *Pārada*. Purified *Gaurīpāṣāṇa* when consumed in optimum dosage for one month, cures asthma and skin diseases. Purified *Gaurīpāṣāṇa* is an antidote for scorpion bite. It also works well in joint disorders and syphilis. Topically, it is used like *kṣārakarma.* It is excreted through urine, faeces, saliva, sweat, tears and breast milk.

Dose : 1 to 4 mg only. To adjust this tiny dose, excipients like black pepper powder and ginger juice are used along with it.

Formulations

Pancasuta, Mallasindūra, Samirapannaga Ras, Ardhāvabhedahara Yoga, Kālanal ras, Candeśwara ras, Tāṇḍavāri Loha, Nityodit Ras, Mallavaṭi, Vaḍavānal ras, Śankhaviṣodaya ras, Sannipāta Bhairava ras, Sucikabharaṇa ras,

NAVASĀDAR

करीर पीलुकाष्ठेषु पच्यपम्मनेषु चोद्भवः । क्षारोऽसौ नवसारः स्याच्चुल्लिका लवणभिश्वः ।।
इष्टिकदहने जातं पांडुरं लवणं लघु। तदुक्तं नवसाराख्यं चुल्लिकालवणं च तत् ।। र.र.स. ३/१२८

A specified *Kṣāra* (alkali) which is produced by burning the wood of *Karīra* and *Pīlu* is known a *Navasādar,* otherwise called *Cullika lavaṇa.* While burning bricks in the brick furnace, a *Pāṇḍura* (yellowish white) coloured *lavaṇa* is evolved, which is called *Navasādar or Cullika lavaṇa.*

Śānskṛt	:	*Navasādara*
English	:	Ammonium Chloride, Ammonium Salts
Hindi	:	Nausādar
Chemical Formula	:	NH_4Cl

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Synonims

Iṣṭikalavaṇa, Cullikalavaṇa, Navasāra, Kiṭṭasara, Narasara, Nṛsāra.

Availability

It occurs during roasting of bricks. It is a by-product of burnt woods of *karira* and *pīlu* plants etc. It is also obtained from residue (ash) of feaces and urine after burning. It is yellowish white granular, Saltish or alkaline in tasts and very light. It is cold on touch and pungent or saltish on taste. Usually *Navasādara* is obtained from the ash collected after roasting the bricks where woods of *Karira* and *pīlu* are used as fuel along with animal feaces and some leaves. It is yellowish white having alkaline nature. It is also called *Cullkā lavaṇa,* as it also obtained from the ash of Culhā where fire woods and dungcakes are used as fuel. In other countries it is obtained from the ash of camel feaces and Urine. In Europe it is made from the man's urine hence, it is called *Narasāra.* It occurs in Itali and obtained from the Volcanic mountains of Sisali. It also occurs in middle Asia. It sublime on heating, water becomes cool when mixed with it.

Pharmacological Properties

Ras	-	*Āmla, lavaṇa, (Kṣāra)*
Guṇa	-	*Hima*
Karma	-	*Jaṭharāgni dīptikara, Srāvana Sothakara, Samastadhātusandrāvaka, Lohdrāvaṇa, Rasendrajārana, Samastagada hara, Bhuktapācana.*
Effect on Doṣa	-	*Tridoṣahara*

Śodhana

नवसारन्तु सलिले त्रिगुणे द्रावयेद्भिषक् । वस्त्रपूतं ततः कृत्वा भाजने स्थापयेत्ततः।।
चुल्लिकायां निधायाथ पचेत्तीव्राग्निना भृशम् । जले शुष्के तलस्थञ्च नृसारं विमलं हरेत् ।।

(रसतर. १४/४)

1. Mix it with hot water and filter it with thick cloth and collect it in a big vessel for drying. After drying it Should be collected in white crystalline or powder form.

2. It may be purified by sublimation method in *Damaruyantra.* Through this process light yellow coloured powder may be obtained.

Therapeutic Uses

Gulma, Pliharoga, Mandāgni, Āsyaṣosaghna, Yakṛodoṣahara, Jwara, Śirahśūla, Arbuda, Stanaroga, Raktapitta, Kāsa, Bhagnaroga, Yonivyāpad, Samastaroga.

रसेन्द्रजारणं लोहद्रावणं जठराग्निकृत् । गुल्मल्पीहास्यशोषघ्नं भुक्तमांसादिजारणम् ।।
बिडाख्यं च त्रिदोषघ्नं चुल्लिकालवणं मतम् ।। र.र.स. ३/१२९

Navasādar is useful in the process of *Jāraṇa* of *Pārada* and in liquifying the metals. Apart from this it alos increases the digestive fire. *Navasāgara* can digest quickly, the heavy (difficult to digest) substances like meat etc. It is also called *Bīḍa lavaṇa* and is capable of alleviating all the three *doṣas.*

Formulations

Kṣāraparpaṭi, Drāvaka Ras, Rājavallabha Ras, Rohitakādyacurṇa, Vriscikadamsahara lepa, Śankhadrāvakaras, Sankhadravakaras (Bṛhad)

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VARĀṬIKA

Varāṭika is external shell of sea animal called Cypreae moneta linn. Usually it reaches the coastal areas of the sea and collected by fishermen. This collected animals are dipped in bioled water. The fleshy portion is taken out and used as a diat, by non-vegetariens. At the same time remained shell is collected and called as *varāṭika*. The upper face is smooth, shining and convex. Base is compressed with a cleft in the center which runs longitudinally. The margin of the cleft is serrated on one side and depressed on the other. The fresh shells consist of a cellular gelatinous tissue filled with calcareous matter (earthy salts). They contain and carbonate of calcium, magnesium phosphate, manganese, flouride and sodium chloride. *Varāṭika or kaparda*, chemically it is carbonate of calcium. *Varāṭika* is used to prepare medicines since ancient days in *Āyurveda*. *Dhārana* of *varāṭika* is practiced for the treatment of *Bālagraha*. *Varāṭika* is used for the playing purpose by children and other persons. In *Rasa Karma*, *Varāṭika (bhasma)* is used for *Pārada Jāraṇa* process for preparing *biḍa*. It is used as neckless form to wear over domestic animal's neck, that is why in pharsi it is called *kharmohara*.

Varg	:	Sādhāraṇa Rasa, Sudhavarg
Śānskrit	:	Varaṭika, Kapardika
Hindi	:	Kauḍi
English	:	Cowries, Marine Shell, Porcelaneous Shells
Chemical Composition	:	Calciumcarbonate (Caco3)
Scientific Name	:	Cypraea Moneta Linn
Phylum	:	Mollusca
Class	:	Gastropoda
Order	:	Streptoneura
Family	:	Molluska, Cypracedae.

Synonyms

Kaparda, Cara, Varāṭa, Kapardaka, Carācara, Varāṭaka, Kapardika, Bālakriḍānak, Varāṭi, Kapardi, Varāṭika. Basically *varatika* is mentioned in *Sādharaṇa Rasa*, because it is useful in *Jāraṇa* of *Pārada*.

Varieties

सार्धनिष्कभरा श्रेष्ठा निष्कभारा च मध्यमा । पादोननिष्कभारा च कनिष्ठा परिकीर्तिता ।। (र.र.स. ३/१३१)

पीताभा ग्रन्थिका पृष्ठे दीर्घवृन्ता वराटिका । रसवैद्यैविनिर्दिष्टा सा चराचरसंज्ञिका ।। (र.स.स. ३/१३०)

In *Rasaśāstra* Varieties of *Varāṭika* are mentioned on the basis of its weight, size and colour etc. On the basis of weight :

Three varieties of *varāṭika* are mentioned on the basis of weight.

Varāṭika		
1 1/2 niṣka	1 *niṣka*	3/4 *niṣka*
(Uttama)	*(Madhyama)*	*(Adhama)*
1 1/2 Śāṇa	1 *Śāṇa*	*1/2 Śāṇa*

Out of these *varāṭika* which is one and half *niṣka* (*1 1/2 Śāṇa*) in weight, is considered as *uttama* (best).

Varāṭika which is one *niṣka* in weight is *madhyama* (Medium).

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Varāṭika which is $^3/_4$ *niṣka* in weight is considered as *hīna* (inferior).

According to Rasaratna Samucchaya

Varāṭika (carācara) : The kapardika which is having yellowish tinge, has nodules on the back and which is oval in shape, is praised as *varāṭika* or *carācara*.

Varāṭa : The *varāṭa* which is not possessing above mentioned qualities, considered as *guru* and to increase *sleṣma* and *pitta doṣa*.

On the basis of colour : Three varieties of *varāṭika* are mentioned on the basis of colour.

1. Pīta *2. Śweta* *3. Dhūsara*

Out of these *Pita* (Yellow) colour *varāṭika* is considered as best. *Sweta* (white) colour as medium and *Dhusara* (Gray) colour as undesired. Properties of acceptable variety of *varatika* : The *kapardika* (*Varatika*) which has yellow tinge, possess nodules (*Pancagulma)* on its back, has large edges, which is oval in shape,which is having weight of 1 *niṣka* is considered as best quality.

Śodhana

वराटाः काञ्जिके स्विन्ना यामाच्छुद्धिमवाप्नुयुः ।। (र.र. स. २/१३४)

अम्लेन केनचिद्वापि दोलायन्त्रे विपाचिता । वराटी याममात्रेण विशुद्ध्यति न संशयः ।। (रसतरं १२/८९)

Table showing the *śodhana* of *varaṭika* according to different books of *Rasaśāstra*.

S. No.	Name of the book	Method	Time	Drava
01	*Rasendra Cūḍāmaṇi*	*Śwedana*	*3 hrs.*	*Kānji*
02	*Rasaprakāsasudhākara*	*Śwedana*	*3 hrs.*	*Kānji*
03	*Rasaratnasamucchaya*	*Śwedana*	*3 hrs.*	*Kānji*
04	*Āyurveda Prakāśa*	*Śwedana*	*3 hrs.*	*Kānji*
05	*Rasataraṅgiṇi*	*Śwedana*	*3 hrs.*	*Kānji*
06	*Bhāvaprakāśa*	*Śwedana*	*3 hrs.*	*Jambiraswarasa*
07	*Rasataraṅgiṇi*	*Śwedana*	*3 hrs.*	*Kuluttha Kaṣāya*
08	*Rasataraṅgiṇi*	*Śwedana*	*3 hrs.*	*Āmladrava*
09	*Rasataraṅgiṇi*	*Śwedana*	*3 hrs.*	*Nimbukāmla*

Māraṇa

वराटकांस्तु विमलान् शरावे स्थापयेद्भिषक् । शरावेणाऽपरेणाथ सम्यगाच्छादयेत्ततः ।।
सन्धिलेपं ततः कृत्वा शोषयेदातपे पुनः । करीषाग्नौ पचेत्कामं यत्नतस्तु भिषग्वरः।।
स्वाङ्गशीतं समुद्धृत्य खल्वे सञ्चूर्णयेत्ततः । शरदिन्दुनिभं भस्म सर्वयोगेषु योजयेत् ।। (रस तरं. १२/९३)
वराटिका विशोधिता त्वलातकानलेस्थिता । यदा भवेत्प्रफुल्लिता मृता तदाशनोचिता ।। (रसतरं. १२/९४)
अंगाराग्नैं स्थिनारधमाता सम्यक् प्रोत्फुलिता यदा । स्वांगशीता मृता तां तुपिष्ट्वा सम्यक् प्रयोजयेत् ।।

(आयुर्वेदप्रकाश, अध्याय २/३००)

Ingredients :

1. Vrāṭika
2. Kumāri/Nimbuswaras

Method : First time *Śodhita varāṭika* as it is kept in *Śarāva sampuṭa.* After ceiling and drying, *puṭa* is given. After that *varāṭika* are collected (which are britle) and powdered. Then *cakrikas* are

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prepared after the *bhāvana* of *ghṛtakumāri swarasa* and dried. Then these *cakrikas* are allowed for second *puṭa*. Same manner 3rd *puṭa* also given. While giving *puṭa* temperature is to be maintained about 700°C in Muffle furnace (if traditional *puṭa* is followed, then *gaja puṭa* is advised).

Characters of Varātika Bhasma : Varāṭika Bhasma will be in *Śweta* (White) colour, *slakṣana, rekhapūrṇa, mṛdu* and having *kṣāra* (Alkaline) *guṇa*.

Pharmacological Properties

Rasa	:	*Kaṭu*
Guṇa	:	*Uṣṇa*
Vīrya	:	*Uṣṇa*
Vipāka	:	*Kaṭu*
Karma	:	*Agnidipana, Pācana, Vṛṣya, Grāhi, Netrya.*

Dose : 2 Ratti (250 mg.)

Anupāna : *Vāsaswarasa, nimbuswaras, trikaṭukaṣāya, udumbara swarasa.*

Therapeutic uses

Agnimāndhya, Grahaṇi, Pariṇāmaśūla, āmlapitta, kṣaya, karṇaśrāva, apaci, śphoṭa, rājayakṣama netraroga.

MṚDDĀRAŚṚNGA

Mṛddāraśṛnga is a yellow oxide of lead and occurs in mines in natural form or prepared artificially in factories. According to description available in *Āyurveda* it is said to occur in *arbuda Parvata* near Gujarat. In nature it occurs as mono-oxide (PbO). When in yellow powder form it is known as massicot and when in buff coloured crystalline form it is known as litharge. On heating, massicot gets converted into litharge. Generally it is of yellow colour but sometimes looks red due to the presence of red oxide of lead. If it is heated with *navasādara* (amonium chloride) its yellow colour becomes more shining. It is described in the text books of *Rāsaśāstra*, which were written after 13th A.D. It is a compound of lead and oxygen, and hence it is also called as Lead oxide (PbO). But the geological survey indicates that ligharge is not available in India. Litharge is used in making leadglass, pottery glazes and rubber.

Śānskṛt	:	*Mṛddāraśṛnga*
English	:	Litharge
Hindi	:	*Murdaśankh*
Chemical Formula	:	PbO

Synonyms

Mṛddāraśṛngaka, Bodara Śṛngaka, Muṛda Śankha, Murda Śankhaka.

Varieties

बोदारशृङ्गकं प्रोक्तं द्विविधं पीतपाण्डुरम् । सदलं निर्दलं तस्व जनिर्मुर्जरमण्डले ।।
अर्बुदाख्यगिरेः पाण्डेय सीतलत्वं स्मृतं परम् ।। (आयु. प्रकाश २/३४४)

Its varieties are described on the basis of its source of occurrence, colour and form i.e.

Source	Colour	Form
1. *Prākṛta*	*Pīta*	*Sadala*

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2. *Kṛtrima*	*Pāṇḍura*	*Nirdala*

Acceptable Variety

Any variety amongst the two can be used for medicinal purpose.

Availability

Mṛddāraśṛnga is available in the mountains of Abu of Rajasthan. Artificial one, can be prepared by two methods.

1. Lead is heated intensely and the yellowish creamy layer which floats on the surface, is gathered. It is collected separately and agian heated. It is artificially prepared *Mṛddāraśringa.*

2. Lead and lead nitrate or lead and potassium nitrate are heated together, which forms this variety.

Śodhana

मृद्दारशृङ्गमानीय कुट्टयेत् खल्वमध्यगम् । प्रस्तरांशं परित्यज्य पेषयेदतियत्नतः ।।
वस्त्रपूतं ततः कृत्वा पुनः सुविमलाम्भसा । पेषयेत्पक्षमेकं तु ततो धर्मे विशोषयेत् ।।
मृद्दारशृङ्गकं काममेतद्विधिविशोधितम् । क्षतेऽवचूर्णनाद्यर्थं युञ्जीन भिषजां वर ।। (रसतरं. २१/१६१)

It is ground into fine powder and seived through a cloth. The seived fine powder is rubbed with water for 15 days and dried in sunlight. It should be noted that *Mṛddarśringa* purified by this method can be used for external purpose only. It is used for dressing the wounds to promote their healing.

Satvapātana

Mṛddāraśṛnga has Lead in its essence (satwa). For extracting its *satva* it should be mixed with 1/4th part *taṅkaṇa* and ground with an acidic liquid and made into *golakas*. The *golakas* are subjected to moderate heating in a *mūṣā* to extract the metal which is claimed to be similar to lead.

Pharmacological Properties

सीससत्त्वं गुरुश्लेष्मशमनं पुङ्गदापहम् । रसबन्धनमुत्कृष्टं केशरञ्जनमुत्तमम् ।। (र.र. समु. ३/१४६)
मुद्दारशृङ्गं शिशिरं परं वातकफापहम् । फिरङ्गव्रणहृत् केश्यं व्रणरोपणुत्तमम् ।।
भग्नसन्धानजननं पामाकण्डूतिकादिनुत् । संकोचकं विशेषेण त्वग्दोषशमनं मतम् ।। (रसतरं. २१/१७१)

Guṇa	*Guru śīta*
Effect on Doṣa	*śleṣmā, vātahar*
Karma	*Rasabandha, keśya, bhagna sandhānakara, vraṇa śodhana and ropaṇa*, improves colour of the skin and complexion.

Therapeutic Uses

Pāma, kaṇḍu, upadamsa, phiranga roga.

AGNIJĀRA

It is an animal product *viz.* the *jarāyu* (an outer covering) of *agnijāra* (a sea animal) obtained from sea. *Jarāyu* is *garbha koṣa* (covering of an embryo).

समुद्रेणाग्निनक्रस्य जरायुर्बहिरुज्जितः। संशुष्को भानुतापेन सोऽग्निजार इति स्मृतः। र.र.स. ३/१३५

According to ancient *Āyurvedic* view *agnijāra* is the dried external covering of an embryo of an

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aquatic animal called *agninakra* which lives in oceans, pushed out of the sea due to waves. When it is dried due to intense heat of Sun and taken to the sea shore. According to modern view it is the dried portion of the fecal matter found in the intestines of dead whale, which is separated from it and taken to the sea-shore by the waves. Its colour is blackish white just like ash and it possesses black spots on its surface. It is opaque, very light, in mass form, insoluble in sea water and contains very pungent or stimulant smell. It resembles musk *(kastūrī)* in properties. It burns in fire leaving no residue. It is brown or ash in colour, aromatic and non transparent. It dissolves in alcohol, ether, perfumed oil and hot water. It doesnot dissolve in cold water. It contains amber and is used as a base in the manufacturing of expensive perfumes. It is light in weight.

Śānskṛt	:	*Agnijāra*
English Name	:	Amber, Ambergrees
Hindi	:	Amber

Synonyms

Agnijār, Vahnijār, Agnigarbha, Jarayu, Sindhu phala and Sindhuplava.

Availbility

Agnijāra is commonly available on the seashores of Srilanka, Lakṣadwīpa, Nicobar Island, India, Arabia, Africa and Red Sea.

Śodhana and Māraṇa

यदब्धिक्षारसंशुद्धस्तस्माच्छुद्धिर्न हीष्यत ।। र.र.स. ३/१३५

Due to the *kṣāra guṇa* (alkaline qualities) of sea water, there is no necessity of subjecting this *agnijāra* again to *śodhana*

Pharmacological Properties

अग्निजारस्त्रिदोषघ्नो धनुर्वातादिवातनुत् । वर्धनो रसवीर्यस्य दीपनो जारणस्तथा ।। र.र.स. ३/१३६

Rasa	*Kaṭu*
Guṇa	*Laghu*
Vīrya	*Uṣṇa*
Karma	*Tridoṣaghna, Dīpana, pācana, grāhi, anulomana, hṛdya, vājikarana and balya.* Enhances the potency of *Pārada,* it is useful for *Dīpana* and *Jāraṇa* Processes of *Pārada.*

Dose : 30 to 60 mg.

Anupāna : *Madhu, Ghṛta*

Therapeutic Uses

Dhanurvāta, Vātaroga, Śūla, grahaṇi and pratiśyāya.

1. *Pakṣāghata :* As an external application of *Agnijāra* mixed with *vātahara* oils and *saindhava lavaṇa* is beneficial in *pakṣāghata.*
2. *Vājikara :* Pills made by pounding *jātiphala, ahiphena* and *Agnijāra* with *bhringarāja swarasa* are used in the management of impotence.

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Formulations

Brihadvātacintāmaṇi rasa, Dhatri rasāyana, Chintāmaṇi rasa, Jaharmoharā piṣṭi (with amber), Javaharamohara vaṭi, Ratneśwar ras, Yakuti, Vaḍavānal ras.

GIRISINDŪRA

Girisindūra is a reddish powder similar to *sindūra* and found in very minute quantities in between the rocks of big mountains. It is probably a compound of mercury and oxygen and occurs in traces in mineral form mixed with other minerals. *Montroydite-* a mineral of mercury oxide closely resembles it. It contains a few particles of free mercury also. According to some scholars it is said to be a lead compound *i.e. nāgasindūra* but owing to its occurrence in minute quantity. *Girisindūra* should be different from *nāgasindūra* and may be the mercury compound, red oxide of mercury. Ancient *Rasavaidyas* are having a definite knowledge regarding the two types of *sindūra* including the therapeutic uses.

Śānskṛt	:	*Girisindūra*
English Name	:	Red oxide of mercury/Montroydite
Hindi	:	*Girisindūr*
Chemical Formula	:	Red oxide of mercury

Synonyms

Sindūra, Mahilabala bhūṣaṇa, Sṛngāra bhūṣaṇa, Māngalya and Nāgabhuṣaṇa.

Availability

Girisindūra is available naturally and also prepared artificially.

महागिरषु चाल्पीयः पाषणांतःस्थितो रसः । शुष्कशौणः निर्दिष्टो गिरिसिंदूर संज्ञया ।। र.र.स. ३/१३८

Between the fissures of the rocks situated in the very high mountains, mercury is available, which is dry in nature and red in colour. This itself is called *Girisindūra.* If lead is kept in a crucible and subjected to heat in the atmosphere, O_2 present in the air combines with lead and turns into raddish coloured lead peroxide. This is considered as artificial *sindūra*. Fine, smooth, heavy, soft, glazy and red colored one is considered to be the best variety.

Varieties

It is of two kinds:

1. *Nāgasindūra or Nāgagarbha sindūra*
2. *Girisindūra or Rasagarbha sindūra*

1. *Nāgasindūra* : It is light red in colour and not glazy and contains lead.
2. *Girisindūra* : It is bright red in colour, glazy and contains mercury and oxygen.

Śodhana

Sindūra is purified, if it is pounded with *jambira swarasa* and heated till the liquid substance is completely evaporated and then should be washed with *taṇḍulodaka.*

Pharmacological Properties

त्रिदोष शमनं भेदी रसबन्धनमग्रिमम् । देहलोहकरं नेत्र्यं गिरिसिन्दूरमीरितम् ।। र.र.स. ३/१३८

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Guṇa : *Uṣṇa*

Karma : *Tridoṣa- śāmaka, Malabhedaka,* it is said to be best in doing *Parada bhandhana* and is useful, both in *Dehasiddhi* and *Lohasiddhi, Netrya (*benefical to eyes).

Dose : for external use.

Therapeutic Uses

Vraṇa śodhana and ropaṇa, twachya, asthi- sandhānakara, Pāma, vicharchika, sidhma, visarpa, rakta doṣa.

1. *Netra Roga :* Exernal application of *giriśindūra* mixed with ghee over eyelids relieves *netra kaṇḍu* and *anjana nāmika.*
2. *Pāda spuṭana :* External application of *giriśindūra* mixed with *madhu, ghṛta, guggulu* and *guḍa* over the foot heals the cracks and make them as smooth as lotus petals.

Formulations

Sindūrādi lepa, Pādadāri malahara.

HIṄGULA

According to *Āyurveda hiṅgula* is said to have originated from mercury. *Hiṅgula* is a compound of *Pārada* and *Gandhaka* which occurs as a mineral in the mines, associated with other minerals and also made artificially. This is a chief source of mercury since ancient times to this date. In ancient times mercury was obtained from it through *pātana* process or *ḍamaruyantra* process and the mercury obtained from this mineral is equal to *gandhaka jārita pārada* in properties *i.e.,* it is less toxic and therapeutically much more potent and could be used even without purification. It is the principal ore of mercury in the world and occurs both in crystalline and massive forms. The red crystalline mass is easily distinguished from all other red minerals by its peculiar shade of colour and its heavy weight. Chemically it contains 13.8% sulphur and 86.2% mercury. The massive cinnabar is usually impure and contains clay, iron oxide, bituminous substances and occasionally organic matters. Usally cinnabar is granular, massive or earthy but sometimes it occurs as beautiful crystals. It is transparent to translucent or opaque; cochineal red in colour often inclining to brown; streak scarlet to reddish brown, lustre dull, perfect prismatic cleavage. Usual associates are native mercury, pyrite, marcasite, realgar, calcite, stibnite, quartz, and opal.

Śānskṛt	:	*Hiṅgula*
English	:	Cinnabar
Hindi	:	*Hiṅgul, Singarph*
Chemical Formula	:	HgS
Hardness	:	2.0-2.5
Sp. Gr.	:	8.1

Synonyms

Mleccha, Cūrṇapārada, Daradaśwaya, Cinapista, Carmāra, Gandhika, Ratnarāgakāri, Haritabharakta, Adhama, Sukatuṇḍa, Hamsapāda, Sapītarakta, Japapuṣpavat, Madhyam, Uttam.

Varieties

Depending upon the precentage of impurities two or three varieties of *hiṅgula* are described.

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Acceptable variety

Haṃsapāda is the best. It is red like *japāpuṣpa or pravāla,* and full of *śalākās* (needle like structures).

हिंगुलः शुकतुण्डाख्यो हंसपादस्तथाऽपरः। प्रथमोल्पगुणस्तत्र चर्मारः स निगद्यते ।।
श्वेतरेखः प्रवालाभो हंसपादः स ईरितः ।। र.र.स. ३/१३९

Śukatuṇḍa and *Hamsapāda* are two varieties of *Hiṅgula*. The former *Śukatuṇḍa* is also called *Carmāra*. It has less therapeutical qualities. The later *Hamsapāda* variety of *Hiṅgula* is red like *Pravala* (coral), with white lines on it.

Another Classification :

1. *Carmāra : Haritarakta – Alpaguṇa*
2. *Sukatuṇḍa : Pitarakta – Madhyama*
3. *Hamaspāda : Japakusuma* (red)- *Uttama*

Śodhana

सप्त कृत्वाप्तऽऽर्द्रक द्रावैर्लकुचस्याम्बुनाऽथ वा। शोषितो भावयित्वाऽथ निर्दोषो जायते खलु ।।
किमत्र चित्रं दरदः सुभवितः क्षीरेण मेष्या बहुशोऽम्लवर्गः । एवं सुवर्ण बहुघर्मतापितं करोति साक्षाद्वरकुंकुम प्रभम् ।।
र.र.स. ३/१४२-१४३

In order to purify and make the *Hingula* devoid of blemishes, it is subjected to 7 *bhāvanas* of juice of either *Ārdraka* (fresh ginger) or *Lakucha* and dried. If *Hingula* is triturated several times in *Meṣidugdha* or in *Kāñji* etc., it is purified and attains beautiful red colour and looks like best kind of *Keśara.*

Satvapātana

दरदः पातनयंत्री पातितश्च जलाशये । तत् सत्वं सूतसंकांशं जायते नात्र संशयः ।। र.र.स. ३/१४४

If *Hingula* is subjected to *Pātana* (heating) in *Adhahapātana yantra,* the *satva* resembling to mercury (mercury itself), callects in the water kept in the lower vessel undoubtedly.

Pharmacological Properties

हिंगुलःसर्वदोषघ्नी दीपनोऽतिरसायनः। सर्वरोगहरो वृष्यो जारणायातिशस्यते ।।
एतस्मादाहतः सूतो जीर्णगंधसमो गुणैः ।। र.र.स. ३/१४०-१४१

Rasa	: *Tikta, kaṭu and kaṣāya*
Guṇa	: *Uṣṇa*
Vīrya	: *Uṣṇa*
Karma	: *Dīpana, rasāyana, vṛsya, balya, vājikara, putrajanana, sukhāyukara, agnivardhana, rucya, divya, netrāmayaghna.*
Effect on Doṣa	: *Sarvadoṣaghna, kaphapittahara*

Therapeutic Uses

Sarvaroga, prameha, kuṣṭa, jwara, hṛllāsa, kāmala, plīharoga, āmavāta, garaviṣa.

The *Pārada* (mercury) extracted from the *Hiṅgula* is as effective as the one which is undergone the *Gandhak jāraṇa.*

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Hinguleśwar Rasa

तुल्यांशं मर्दयेतु खल्ले पिप्पलीं हिङ्गुलं विषम् । गुन्जार्धं मधुना देयं वातज्वरनिवृत्तये ।।

(भै. र. ज्वराधिकार; ४८३)

Ingredients

1. *Pippali* - *346 gm.*
2. *Hingula* - *346 gm.*
3. *Vatsanābha* - *346 gm.*

Dose : Ratti

Anupāna : *Madhu*

Therapeutic Uses

Vāta Jwara

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Chapter 9

DHĀTU

Mineralogical point of view the number of metals found in nature throughout the world is innumberable. But only a few of them have been recognised to possess medicinal values in ancient time. The present description is limited to such metals only. According to ancient scholars. (Alchemists), *Pārada* (mercury) is considered most important amongst all metals recognised for their medicinal value. As it possesses a power to influence the properties (physical & therapeutic) of all other metals to such an extent that sometimes these may completely change from original ones.

लोहानां मारणं श्रेष्ठं सर्वेषां रसभस्मना। मूलिभिर्मध्यम् प्राहुः कनिष्ठं गन्धकादिभिः।
अरिलोहेन लोहस्य मारणं दुर्गुणप्रदम्।। र. र. स. ५/१४

Incineration of metals with mercury results in *uttama bhasma*. Incineration of metals with herbs results in *madhyama bhasma*. Incineration of metals with sulphur and other substances results in *adhama bhasma*. Incineration of metals with arilohas and other substances results in *durguṇa bhasma*. *Ari lohas* are those used in the process of incineration of metals, cause the alteration in the nature as well as the properties of metals. Internal administration of *bhasmas* prepared by means of incineration with *arilohas* and *kṣāras* causes harmful effect to the patients. Incineration of metals by mixing with mercury causes elimination of *doṣas* from the metals and at the same time *Pārada doṣas* are also eliminated. Hence, it is better to do *māraṇa* of the metals with mercury in the process of incineration.

Dhātu (Metal) is defined as, the drug which is useful for the human beings to relieve the wrinkles on the face, graying of hair, baldness, emaciation, weakness, advancement of ageing, fever and other diseases. Description of *Dhātus* is available since Vedic period. In the *Āyurvedic* classics like *Caraka Saṁhitā*, description of 8 metals is available at different places, Whereas in *Suśruta Saṁhitā* only five metals are described. In *Rasārṇava*, description of the following six metals is available i.e. *Suvarṇa, Rajata, Tāmra, Tīkṣana loha*, *Nāga* and *Vaṅga*.

According to Rasa *Hṛdayatantra* these are classified under the following 3 groups viz.

1. *Sāra loha* : *Suvarṇa, Rajata*
2. *Sādhāraṇa loha* : *Tāmra, Tīkṣaṇa Loha*
3. *Pūti loha* : *Nāga, Vaṅga*

Some opoined that *Śuddha dhātus* are those containing the atoms of that particular metal. *Pūti* means putrified smell. Whatever metals emits putrified smell on heating are called *Pūti loha*. Alteration of colour on exposing of external atmosphere is seen with these metals. Combination of more than 2 metals are called *Miśra loha* or alloys.

वलीपलितखालित्य कार्श्याबल्यजरामयान्। निवार्य दधते देहं नृणां तद्धातवो मताः।। आ. प्र. ३/२
माक्षिकं तुत्थकाभ्रे च नीलान्जनशिलालकाः। रसकश्चेति विज्ञेया एते सप्तोपधातवः।। शा. सं. ११/५३

Mākṣika, Tutha, Abhraka, Nīlāñjana, Manahśila, Tālaka and *Rasaka* these seven are known as *Updhātus*.

तैले तक्रे गवां मूत्रे ह्यारनाले कुलत्थजे। क्रमान्निषेचयेत्तप्तं द्रावे द्रावे तु सप्तधा।।
स्वर्णादिलोहपत्राणां शुद्धिरेषां प्रशस्यते। र. र. स. ५/१३

In order to purify the *Swarṇa* and such metals, they are made in to a thin leaves and heated

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intensively in the fire. Then they are immersed in the *Taila* (oil), *Takra* (butter milk), *Gomūtra* (Cow's urine), *Kañji* (gruel) and *Kulattha kwātha* (decoction of *Kulatha*), in that order, for seven times, in each of the liquid. This process purifies the metals.

The term *Loha* is derived from the word *Luh* which means to extract or to pul out.

Lohas (metals) which have been recognised for their medicinal values though many metals are found described in the literature since ancient times from the mineralogical point of view. The metals described in *Rasa Ratna Samuccaya* have been divided in the following three groups on the basis of their form and characters

शुद्धं लोहं कनकरजतं भानुलोहाश्मसारम्। पूतिलोहं द्वितयमुदितं नागवंगाभिधानम्।।
मिश्रंलोहं त्रितयमुदितं पित्तलं कांस्यवर्तम्। धातुर्लोहे लुह इति मतः सोऽपिकर्षार्थवाची। र. र. स. ५/१

(A) *Śuddha lohas*		1. *Śuvarṇa*	-	Gold
		2. *Rajata*	-	Silver
		3. *Tāmara*	-	Copper
		3. *Loha*	-	Iron
(B) *Pūti lohas*	-	1. *Nāga*	-	Lead
		2. *Vaṅga*	-	Tin
(C) *Miśra lohas*	-	1. *Pittala*	-	Brass
		2. *Kāṃsya*	-	Bronze/Bell metal
		3. *Varta loha*	-	(An alloy of five metals)

It is evident from this classification that in the first group four such metals have been included which may be found in their pure form in nature. In the second group low melting metals are included while in the third group alloys of metals are included. It is also evident from this classification that during the period of this text nine metals including some alloys were recognised for their medicinal properties. Besides the nine *lohas* (metals) *maṇḍūra/lohaiṭṭ* (rusted iron) is also found described and advised to be used for its medicinal value.

In another context *dhātus* are classified as :

In *Rasa Ratna Samuchchaya dhātus* are classified as under :

1. *Sahaja loha* (natural) : *Swarṇa* to *vaṅga* (6)
2. *Kṛtrima loha* (Artificial) : *Kāṁsya* and *pittala*

The term *loha* was being used for metals since ancient times but the meaning of the term is found explained in the fifth chapter of *Ras Ratna Samucchaya* only. According to this, the term *loha* is derived from the root *luh* meaning *karṣaṇa,* that is extraction. Thus, the *lohas* (metals) are those which are obtained from the respective minerals/ores by the method of extraction. While the minerals/ ores generally are in compound form and contain some kind of impurities besides their metallic contents, the *lohas* are pure metals free from impurities. The later periods, that is from the period of *śārṅgadhara saṃhitā* onwards another term *dhātu* is also found being used for the metals. The meaning of the term *dhātu* is *dhāraṇa, i.e.* the metals are known as *dhātus* because they may help in the maintenance of the body or they may sustain the body tissues in a healthy state. Hence the term *dhātu* is also very meaningful, and probably because of this reason (meaningfulness) the term *dhātu* became more popular for the metals and replaced the term *loha* in course of time.

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Sl No.	Name of the drugs	Ras.	R.M.	R.H.T.	R.Cu.	R.Ci.	R.P.S.	R.S.S.	R.R.S.	R.S.K.	R.K.	R.P.	R.K.Dh.	S.S.	B.P.	A.P.	R.T.	Rasa.
		Name of the Texts																
1.	Suvarṇa	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2.	Rajata	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
3.	Tāmra	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4.	Loha	–	+	–	+	+	+	+	+	+	+	+	+	–	+	+	+	+
5.	Nāga	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
6.	Vanga	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
7.	Pittala	–	–	+	+	+	+	–	+	+	–	Ghana	+	+	–	+	–	+
8.	Kāmsya	–	–	–	+	+	+	–	+	+	+	+	+	–	–	+	–	+
9.	Vartaloha	–	–	–	+	–	+	–	+	–	–	+	–	–	–	+	–	–
10.	Rasaka	–	–	–	–	–	–	–	–	+	+	–	Vajra	–	–	–	–	+
11.	Kāntaloha	–	–	+	+	–	+	–	+	–	–	–	+	–	–	+	+	Kānta Pāṣāṇa
12.	Tīkṣṇaloha	+	–	+	+	–	+	–	+	–	–	–	+	+	–	+	+	+
13.	Muṇḍaloha	–	–	+	+	–	+	+	+	–	–	–	+	–	–	+	+	+
14.	Maṇḍūra	–	–	–	–	–	–	+	+	+	–	–	+	–	–	+	+	+
15.	Abhrakasatwa	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	Abhraka
16.	Kharpara	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–
17.	Yaśada	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	+	+
18.	Makshika	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
19.	Tuttha	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
20.	Sindūra	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
21.	Mṛddāraśṛnga	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
22.	Anjana	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
23.	Vimala	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
24.	Kāsīsa	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
25.	Gairika	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+

Full form of the Texts : Ras = Rasārṇavatantra, R.M. = Rasendramangala, R.H.T. = Rasahṛdayatantra, R.Cu = Rasendra Cūḍamaṇi R.Ci = Rasendra Cintāmaṇi, R.P.S. = Rasaprakāśa Sudhākara, R.S.S. = Rasendrasārasangraha, R.R.S. = Rasaratnasamuccaya, R.S.K. = Rasasanketakalika, R.K. = Rasakaumudi, R.P. = Rasapaddhati, R.K.Dh. = Rasakāmadhenu, S.S. = Śārngadharasaṁhitā, B.P. = Bhāva Prakāśa, A.P. = Āyurveda Prakāśa, R.T. = Rasatarangiṇi, Rasa = Rasāmṛtam

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Origin of lohas

According to *Rasa* literature *lohas* are said to have originated from the nine planets and are claimed to please the respective planets from which they have taken their origin. The relationship of the nine metals with the nine planets is shown below.

The nine planets and the corresponding nine metals originated from them

Planet	Metal
1. *Sūrya* (Sun)	*Tāmra* (copper)
2. *Candra* (Moon)	*Rajata* (silver)
3. *Maṅgala* (Mars)	*Pittala* (brass)
4. *Budha* (Mercury)	*Nāga* (lead)
5. *Guru* (Jupitar)	*Suvarṇa* (gold)
6. *Śukra* (Venus)	*Vaṅga* (tin)
7. *Śani* (Saturn)	*Loha* (iron)
8. *Rāhu* (Dragon's head)	*Kāṃsya* (bronze)
9. *Ketu* (Dragon's tail)	*Varta loha* (Alloy of five metals).

The *lohas* are also said to have originated from different *Gods*. Thus, *suvarṇa* (gold) is said to have its origin from *Agni, rajata* (silver) from *Candramā, tāmra* (copper) from *Sūrya, vaṅga* (tin) from *Indra*, *nāga* (lead) from *Vāsukī* and *loha* (iron) from *Yama*.

In modern since *lohas/dhātus* are known as metals and should posses the following characteristics/properties:

1. Metallic lustre, 2. High specific gravity, 3. Good conductivity of heat and electricity, 4. Malleability, 5. Specific melting point, 6. Ductility.

The chemical symbol, specific gravity and melting point of the metals used in Āyurvedic *Rasa* literature are given below.

No.	Metal	Chemical Symbol	Atomic No.	Atomic wt.	Sp.Gr.	Melting point °C
1.	*Swarṇa* (gold)	Au	79	196.967	19.4	1062
2.	*Rajata* (silver)	Ag	47	107.870	10.5	960
3.	*Tāmra* (copper)	Cu	29	63.54	9.7	1085
4.	*Loha* (iron)	Fe	26	55.847	7.7	1520
5.	*Nāga* (lead)	Pb	82	207.19	11.4	325
6.	*Vaṅga* (tin)	Sn	50	118.69	7.28	233
7.	*Yaśada* (zinc)	Zn	30	65.37	7.1	410

In modern science *miśra lohas* are known as alloys. These are made by the mixing together of two or more metals after melting. A number of alloys are described in modern metallurgy but only three alloys (*miśra lohas*) are found described in ancient Āyurvedic *Rasa* texts. These are:

Pittala (2 parts copper, 1 part zinc),

Kāṃsya (8 parts copper, 2 parts tin),

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Varta loha (kāṃsya, tāmra, pittala, loha, and *nāga* in equal parts).

SWARṆA

Gold is a costly yellow metal and a large quantity is used for the manufacture of jewelry, decorative articles and medicines. Description pertaining to gold is available since antiquity. *Maharṣi Caraka* and *Suśruta* have mentioned gold in the management of many diseases. According to ancient texts *Swarṇa* is said to be the semen of *God Agni*. It is said in *Rasendra Cūḍāmaṇi* that once *God Agni* saw the young and beautiful wifes of the *saptaṛṣis* (the seven sages) and got excited. He discharged his semen which on falling on the earth got converted into gold. According to modern view also gold is obtained in three forms, native gold, gold minerals/ores, and through transformation.

Gold is a soft metal, very heavy in nature. Copper is mixed with it for making it hard and only then could it be used for ornament making purposes. Purity of gold is expressed in terms of carats and the 24 carat gold is considered pure. In the 14 carat one, Gold content is approximately 60%. Gold is malleable and ductile and possesses a bright metallic lustre. Its colour varies from grey to yellow. In nature it is found in free state as well as in compound state. It is frequently associated with silver and may contain traces of copper, iron and other metals. The colour of its minerals varies from pink to copper red depending upon the proportion of impurities. Pure gold is bright yellow. In very thin plates or leaves gold is translucent with a blue or green tinge. Its streak is yellow. It is a good conductor of electricity and is not acted upon by water and atmosphere, is insoluble in most acids but readily soluble in *aqua regia*. It is distinguished by its softness, malleability and high sp.gr. It is considered a precious metal. Native gold occurs in quartz veins and in some riverain sand. In quartz veins it occurs in grains/scales. Pyrite is nearly always associated with gold. Its crystals are small, more or less distorted but rarely found. The common form is octahedron, cubic or rhombic. Gold occurs in *situ* and in secondary deposits called placers. In India gold is found in large quantities in Kolar mines of Karnataka and also from Anantapur mines of A.P. It is also found in riverain sands in Bihar, Assam and Madhya Pradesh. Outside India, gold is found in Australia, USA, South Africa, Mexico and USSR.

Native gold generally contains varying amounts of silver (40%), iron, copper, bismuth, zinc, lead and tin.

Śānskṛt	:	*Swarṇa*
English Name	:	Gold
Hindi	:	Sona
Chemical Formula	:	Au
Hardness	:	2.5
Sp.Gr.	:	19.43
Melting point	:	1062°C.

Synonyms

Kanaka, Hema, Agnivīrya, Māngalya, Kaladhauta, Kalyāṇa, Kāñcan, Cāmīkar, Jāmbunad, Tapanīya, Bhasvar, Manohar, Rukma, Lohavar, Suvarṇa, Swarṇa, Hāṭaka & Hiraṇya.

Varieties

प्राकृतं सहजं वन्हिसम्भूतं खनिसम्भवम्। रसेन्द्रवेधसन्जातं स्वर्णं पंचविधं स्मृतम्।। र.र.स. ५/२

Five varieties of gold, namely *prākṛta, sahaja, vahni sambhūta, khanija,* and *Rasendravedhaja* are mentioned in ancient texts. Out of these the first three varieties are said to be divine, having

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śoḍaśavarṇas (sixteen colours) and are claimed to be rare. Hence in later works only two or three varieties, namely *rasaja, kṣetraja, loha saṅkaraja* or *rasaja,* and *khanija* are found mentioned.

Gold is available in 2 states as under

1. *Muktavaṣṭha* and 2. *Yougikavaṣṭha*

Gold available in the state of *Muktavaṣṭha* is also called native gold. Calaverite (Au Te2), silvenite (Au $AgTe_2$) etc. are the ores of gold.

Availability

Gold is available in the countries like South Africa, Russia, America, Brazil, Germany, Britain etc. India has very meager gold reserves. Karnataka is the largest producer of gold in our country. It is available in Kolar, Mysore and Raichur of Karnataka, ananthapur district of Andhra Pradesh, coimbatore and Nilgiri districts of Tamilanadu, Kozhikode of Kerala and Singhbhumi of Bihar.

Necessity for śodhana (purification)

As gold is considered the purest metal amongst all other metals used for medicinal purposes some texts do not consider its *śodhana* essential. However, some other texts recommend its *śodhana,* specially if it is of *hīnavarṇa* quality (having a purity less than 24 carat). According to *Rasendra Sāra Saṃgraha* and *Rasakāmadhenu* impure and unincinerated gold, if used internally, is likely to prove harmful and may produce loss of *saukhya, bala* and *vīrya* and also may cause many diseases; hence it should be purified and converted to ashes.

Śodhana

Drugs–Khaṭikā, lavaṇa, gairika, gṛhadhūma, iṣṭikā cūrṇa, valmīkamṛttikā, kāñjika, jambīra rasa.

Method : Applying of the paste of *pañcamṛttikā* or *khaṭikā and lavaṇa* prepared in *kāñjika* or *jambīra rasa* and subjecting to *puṭa pāka* in *laghupuṭa* using *vanyopalas* as fuel.

Māraṇa

कृत्वा कण्टकवेध्यानि स्वर्णपत्राणि लेपयेत्। लुंगाम्बुभस्मसूतेन म्रियते दशभिः पुटैः।। र.र.स. ५/१५

Drugs–Pārada, pārada bhasma, gandhaka, nāga cūrṇa, purāmbu (guggulu water), *jvālāmukhī swarasa.*

Bhāvanā drugs–Nimbū rasa, kāñcanāra rasa, lāṅgalī rasa.

Method : Take equal parts of *Gold & Pārada*, mix them well by grinding & prepare a paste and make it into a ball. Take *sulpur* equal to both & place it below end over the ball in a *sarāva saṁpuṭa* and apply *puṭa.*

Type and *number of puṭas : Kukkuṭa* ten to fourteen times, or heat it with five to thirty *vanyopalas.*

Colour of bhasma –Kuṅkumacchāya, gairika or sindura varṇa, campakavarṇa

Out of these methods the *bhasma* prepared by adding mercury and sulphur or their compounds is said to be *niruttha* and the best. Hence in practice also *śvarṇa bhasma* is prepared with mercury and sulphur or with their compounds.

Acceptable variety

The gold which is red on heating, white on cutting, yellow on rubbing over *nikaṣa* (touch stone), heavy, soft, smooth, having shining bright colour, free from scales and contains *śoḍaśavarṇas* (sixteen colours) is considered superior.

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Inferior variety

The gold which is dull, blackish or grey coloured, rough, hard, thick, light, not malleable and contain scales and other metallic impurities is considered inferior.

Pharmacological Properties

मृतं सुवर्णं मधुरञ्च वृष्यं हृद्यञ्च नेत्र्यं परमञ्च मेध्यम् । रसायनं पुंसवनोपयोगि विषापहं कान्तिकरञ्च शस्तम् ।।

र.र.स. १५/६९

एतद्भस्म सुवर्णजं कटुघृतोपेतं द्विगुंजोन्मितं लिढं हन्ति नृणां क्षयाग्निसदनं श्वासं च कासारुचिम् ।
ओजोधातुविवर्धनं बलकरं पाण्ड्वामयध्वंसनं पथ्यं सर्वविषापहं गरहरं दुष्टग्रहण्यादिनुत् ।। र.र.स. ५/१८

Rasa	-	*Madhura, kaṣāya, tikta, and kaṭu*
Guṇa	-	*Śīta, guru, snigdha.*
Vīrya	-	*Śīta.*
Vipāka	-	*Madhura.*
Karma	-	*Vṛṣya, balya, bṛmhaṇa, rasāyana, medhya, matismṛtiprada, netrya, āyuṣya, kāntikara, vāgviśuddhikara, sthiratvakṛt, pavitra, pāpaghna, śivatarakara, paramaviṣaghna, garaviṣahara, sukhakara, lekhana, deharogapramāthī, praśamitajara, bhūtāveśāpraśāntikara, rucya, tvacya, varṇya, puṣṭipradāyī, ojavardhana, vayassthairyakara, bhavasukhakara.*
Effect on Doṣa	-	*Tridoṣaghna.*

Dose : 15 to 30 mg.

Therapeutic Uses

Viṣagarodbhava roga, āgantuka roga, pāpaja roga, tridoṣaja roga, daivakṛta roga, jarāroga, śoṣa roga, kṣaya, pāṇḍu, vami, aruci, agnimāndya, arśa, jvara, śvāsa, kāsa, yakṣmā, unmāda, prameha, kārśya, duṣṭagrahanī, sarpaviṣa.

Formulations

1. *Kasturibhairava rasa, Kancanābhra rasa, Kumudeśvar rasa, Kṣayakeśari rasa, Caturbhuj rasa, Caturmukha rasa, Trayolokya cintāmaṇi rasa, Navaratna rāja mṛganka rasa, Maha mṛganka rasa, Mehakesari rasa, Yogendra rasa, Vasantamalati rasa, Vārisoṣaṇa rasa, Śwāsakasacintamaṇ rasa, Sarveśwar rasa, swarṇaparpati, Hemgarbha poṭṭali rasa , Bṛhad- vāta- cintāmaṇi rasa, Vasanta kusumakara rasa, Makardhwaja, Rasarāja rasa, Mahalakṣmi vilāsa Rasa*

RAJATA

According to ancient texts, silver is believed to have originated from the semen of *Candramā (Moon)*. According to *Āyurveda Prakāśa* it is said to have originated from the falling drops of tear from the third eye of *Lord Śiva* on his becoming angry. *Rajata* is a famous white metal and a mineral product. It is also used in the preparation of ornaments like gold. The Indians possess the knowledge regarding silver since *Vedic* period. In *Āyurvedic* classics, especially in *Caraka Saṁhitā* descriptions regarding silver vessels and *vastinetra* prepared with silver metal are available. After 5th century AD, different kinds of silver, their featrures, purification and incineration techniques were elaborately described in different *Āyurvedic texts*. Like gold, silver is also a soft, malleable and ductile metal

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which is an excellent conductor of heat and electricity. It is lighter than gold. Its colour is white but may have grey, black, bluish-black tarnish which may be the effect of atmosphere. Chemically, the tarnish is due to the formation of oxide or sulphide. Its fracture is hackly. Silver is readily soluble in nitric acid. It possess metallic lustre, has silver white streak and shining appearance. Silver can be distinguished from other metals by its colour, sp.gr., and malleability.

Śānskṛt	:	Rajata
English Name	:	Silver
Hindi	:	Chandi
Chemical Formula	:	Ag
Hardness	:	2.3
Sp. Gr.	:	10.5
Melting point	:	960°C

Synonyms

Rajata, Roupya, Tāra, Mahaśubha, Śubhra, Saudhd, Candraloha, Candrahāsa and Rupyaka.

Varieties

Three varieties of *rajata* have been mentioned in *Rasa texts.* These are :

1. *Sahaja* (native) - Which occurs at *kailāsaparvata* - Best.
2. *Khanija* (mineral) - Which occurs at *Himālaya parvat.* Better.
3. *Kṛtrima* (artificial) - Which occurs through mercurial transformation from lower metals-Good.

Of these, the *sahaja* is claimed to be *durlabha* (rare), and the *khanija* is common and is said to posses *rasāyana* property. The *kṛtrima* is also rare and said to be produced through transformation of lower metals by the effect of mercury.

According to *Rasārṇava, Rajata* is divided into white & black varieties. The white variety is pure and the black is impure. From the mineralogical point of view the above three varieties are still available. In nature silver is usually found in large irregular masses, in flat scales and in granules or crystals. Crystals usually small & distorted, cubes and octahedrons are more common. Native silver may be taken as *sahaja Rajata.* Sometimes silver occurs as native silver in large twisting branching masses. Another important source of silver is the sulphide (Ag 25) Argentits. The mineral black *Rajata* usually contains varying amounts of gold up to 28% and also copper, arsenic, mercury, iron, antimony and platinum. Sometimes it is round associated with lead. This may be taken as *Khanija Rajata.* Galena (PbS) is also an important source of silver but in this mineral the percentage of silver is less. Sometimes it is found in gold minerals but only in traces. According to *Rasārṇava* best *Rajata* should possess the following properties i.e. *guru, snigdha, mṛdu,* and *śweta.* According to *Rasendra cūḍamaṇi* the best *rajata* should remain white after cutting and heating should be clear as *Śankha* (conch shell), should not be brittle, and solid, such silver is recommended for use. In some texts *rajata* similar to the moon in colour is considered best.

Availability

In nature, silver is usually found in large irregular masses, in flat scales and in granules or crystals. Crystals are usually small and sometimes distorted. Cubes and octahedrons are more common. It is native silver and may be taken as the *sahaja* variety of silver described by ancient scholars. How-

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ever, pure silver is not common in nature. Another important source of silver is its sulphide mineral argentite (Ag_2S). The mineral is black in colour and usually contains gold upto 28% and also copper, arsenic, mercury, iron, antimony and platinum in traces. It is sometimes associated with lead also. This may be taken as the *khanija* variety of silver. Galena (Pbs) is also an important source of silver but here the percentage of silver is low. Sometimes silver is also found in gold minerals but only in traces.

Silver is found in veins of calcite ($CaCO_3$) and quartz (SiO_2). It occurs invisibly, disseminated in small quantities in many minerals particularly sulphides, and visibly intermingled with native copper. Silver is mixed with copper to make it hard. It is also considered a precious metal and is used for coinage, jewellery and medicine. Silver is available in the countries like Mexico, Norway, America, Australia, New South Wales etc. Rajasthan is the leading producer in India, a little quantity of silver being exported in recent years. It is available in Udaipur (Rajasthan), Kolar & Chitradurg of Karnataka, Cuddapah, Kurnool districts of Andhra Pradesh.

Śodhana

नागेन टङ्कणेनैव वापितं शुद्धिमृच्छति। तारं त्रिवारं निक्षिप्तं तैले ज्योतिष्मतीभवे।। र.र.स. ५/३१

Ill effects of unincinerated rajata :

Aśuddha and improperly Prepared *bhasma* of *rajata* used internally is likely to cause diseases like *śukranāśa, malabaddhatā, jvara* and *dāha.* Hence its *śodhana* and *māraṇa* are necessary.

Drugs – *Kṣāra* and *āmla* drugs, *taila, takra, gomūtra, kāñji, kulattha kaṣāya, agastya patra rasa.*

Method – 1. *Pācana* (heating) with above mentioned drugs.

2. Heating and dipping in the prescribed liquids for several times.

Māraṇa

Drugs– Purified mercury, sulphur, cinnabar, orpiment, chalcopyrite, *kajjalī, nimbūrasa, snuhi kṣīra.*

Bhāvanā – *Āmla drava.*

Method : Silver purified one part, *Pārada* purified 4 parts, mix and rub with *Nimburasa* till a paste is made. Now place *sulphur* at the bottom of the *mūṣā* and put the paste and cover it with sulphur again, heat it in a *Bālukā yantra* for one day with strong heat. Now mix-*orpiment* grind with *Āmladrava* and apply 12 *Laghū* or *Kukkuṭa puṭas.* Take 1/4th orpiment make a paste with *Nimbū rasa* apply it on *Tārapātras* (silver leaves), close it in *Śarāva saṁpuṭa* after drying, heat it with 25 *vanyopalas.* Repeat the process three times. In the 2nd and 3rd times use *sulphur* in place of *Tālaka.* Take *Mākṣika* 1 part, make a paste with *Snuhīkṣīra* and apply it on 3 parts of *Tārapatras,* put the same in *mūṣa,* heat it with 30 *vanyopalas* apply *14 puṭas* to complete the *māraṇa* process. Take 1 part of *rajata* and 2 parts of *Hingula,* mix and grind with *Nimburasa* to make a paste. Divide in *cakrikas,* dry it and put them in *Damaruyantra,* seal the *yantra* well, apply heat to the lower vessels and cool the upper vessel to sublime *pārada.* In the end collect the *black power* from the lower vessel and *pārada* from the upper vessel. Repeat the process 2-3 time to complete the *māraṇa process.* In the 2nd and 3rd processes use *Hingula* in equal parts. This is the best process for the *māraṇa* of *Rajata.*

Number of puṭas– *Kukkuṭapuṭa* or *laghupuṭa* using twenty to thirty *vanyopalas.*

Colour of bhasma– *Generally black Colour.*

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Pharmacological Properties

रूप्यं विपाकमधुरं तुवराम्लसारं शीतं सरं परमलेखनकं च रूप्यम्।
स्निग्धं च वातकफजिज्जठाग्निदीपकम् बल्यं परं स्थिरवयस्करणञ्च मेध्यम्।।
रौप्यं शीतं कषायाम्लं स्निग्धं वातहरं लघु। रसायनविधानेन सर्वरोगापहारकम्।। र.र.स. ५/२८-२९

Rasa	: *Madhura, āmla, kaṣāya.*
Guṇa	: *Śīta, snigadha, sara*
Virya	: *Śīta*
Vipāka	: *Madhura*
Karma	: *Lekhana, vayasthāpana, vayasthairyakara, āyuprada, vṛṣya, paramabalya, varṇya, rucya, medhya, puṣṭikara, vīryavardhaka, rasāyana, ajarākara, jaṭharāgnidīpana, dīrgha rogaghna.*
Effect on Doṣa	: *Vātapittajit*

Dose : 60 mg - 120 mg

Therapeutic Uses

Pittaja roga, kṣayaja roga, gudaja roga, netra roga, pāṇḍu roga, sarvadoṣaja roga, dīrgha roga, prameha, timira, yakṣmā, śvāsa, kāsa, jvara, tṛṣṇā śoṣa, ajīrṇa, aruci, udara, arśa, gulma.

Formulations

Induvaṭi, Unmādbhañjan rasa, Kasturibhairava rasa, Kumudeśwar rasa, Garhaṇīkapāṭa rasa, Jaimangal rasa, Jawaharmohara vaṭi, Trailokyacintāmaṇi rasa, Navaratnarājamṛgānka rasa, Nityodaya rasa, Makaradwaj vati, Mahamṛgānka rasa, Maharājanṛpativallabh rasa, Rajatadi Lauh, Ratneśwar rasa, Vaṅgaṣṭaka rasa, Variśoṣaṇ rasa, Vijayaparpaṭi, Viṣamjwarantaka Lauh, Sarvajwarhara Lauh, Somnath ras, Swachandanayako rasa.

Triloha Bhasma according to Rasajalanidhi - Swarṇa 25 parts, *rajata*-16 parts and *tāmra* –10 parts. Take the above 3 drugs in the said ratio and incinerate them similar to gold, which results in *Triloha bhasma*. If it is not properly incinerated it acts as poison. Properly (incinerated) prepared *triloha* acts as *dīpana*, *pācana* , *rasāyana*, sarva *doṣahara*. *Triloha* if taken in a dose of 1 ratti along with ghee, honey and *trikaṭu* along with wholesome diet imparts long life and arrests wrinkles on the face and grey hair.

TĀMRA

Copper is said to have originated from the semen of *Kārtikeya* (the son of *Lord Śiva)* which fell on the earth. According to *Rasa Kāmadehnu, śulva* is said to have originated from *Śūrya (sun)*. In *Suśruta Saṁhitā*, several references of *tāmra* are available at different places. It is described in a group with other metal along with its pharmacological properties and actions, which are clearly mentioned and it is therapeutically indicated for the treatment of worm infestation, anemia and diabetes. The water stored in *tāmra* pots becomes free from all toxic effects and is recommended for drinking purposes, for the patients of Edema, Anemia, Skin diseases, Asthma, Cough, Coryza and Pain in abdomen. In nature copper is found in native form as well as in the form of sulphides, oxides and carbonates. Native copper is very rare. Generally copper is obtained from its minerals. Nearly 200 to 300 copper ores are seen in nature, of which sulphide group of minerals are the more common. In sulphides chalcocite chalcopyrite covallite and cuprite Bornite are the commonest. Of the oxides cu-

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prite and of the carbonates Malachits and Azurite deserve mention. *Native copper* crystals are rather common but usually distorted. Tetrahexahedrons, rhombic, and cubes are the most commonly observed froms, generally in scales, grains, plates and masses. Hackly fracture, metallic lusture. Ductile and malleable, colour copper red of fresh fracture. Due to tarnish and decomposition products colour may be superficially black, red green or blue, streak-copper red, metallic and shiny. Excellent conductor of heat and electricity. Native copper is generally almost pure, but sometimes contains small amounts of silver, arsenic, bismuth and antimony. It occurs principally in volcanic rocks, in veins, in dark coloured igneous rocks. Native copper is hard to mine. The sulphides and carbonates are easier to handle. The sulphides are black, purple and yellow. The oxides and native copper are dull red, the carbonates blue and green. The common associates are calcite, quartz and silver. America, Chile, Peru, Cyprus, Africa, Japan, Australia, Northern Rodesia, Canada, Congo and Russia have large deposits of copper. The percentage of copper in its ores depends on the nature of the place from which it is obtained. In very thin plates it is translucent with a green colour. It fuses at 1085^0 and easily dissolves in acids. The most characteristic chemical reaction is its solubility in nitric acid with the evolution of brownish red fumes and nitric oxide gas. It is an important constituent of the valuable alloys like brass, bronze, bell-metal and German silver. Blue vitriol (Copper sulphide) is its important compound and is used as a fungicide. Some compounds of copper are used as insecticides. Copper and its compounds when put on fire yield a bluish green flame which is suggestive of the presence of copper in the compound. This flame test for copper is mentioned in ancient texts also.

Śānskṛt	:	Tāmra
English	:	Coper
Hindi	:	Tamba
Latin	:	Cuprum
Chemical Formula	:	Cu
Hardness	:	2.5 to 3
Sp. Gr.	:	8.5 to 9
Boiling Points	:	2300^0C

Synonyms

Anuvindam, Ambakam, Arvindam, Arkam, Arkeṣṭam, Udumbaram, Kariyasam, Kaniysam, Kamalāhyayam, Karendudha, Kamyam, Tapneṣṭam, Tāmrakam, Trayambkam, Dwiṣṭam, Dvayaṣṭam, Nepaliyam, Nepalkam, Pavitram, Pavitrakam, Brahmavarchasam, Bhāskaram, Raktam, Raktakam, Rakta dhātu, Rakta dhātukam, Ravi Loham, Ravi Priyam, Raktam, Rajivam, Lohitayas, Śulvam, Surya Loham, Suryakhyam, Suryogam, Suryeṣṭam.

Varieties

सुस्निग्धं मृदुलं शोणं घनाघातक्षमं गुरू। निर्विकारं गुणश्रेष्ठं ताम्रं नेपालमुच्यते।

र.र.स. ५/४४

According to available literature there are two varieties of *Tāmra*. One is *Mlechha* and the other is *Nepālaka*. The Variety found in *Nepal* is known as *Nepālaka Tāmra*, while the variety obtained from the other mines is called *Mlechha Tāmra*. Out of these two *Nepalaka Tāmra* is said to be superior one.

On the other hand, the *Nepalāka Tāmra* is very smooth. Red and able to bear even strong ham-

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mering. It is heavy and free from effects and has beneficial properties.

Necessity of Śodhana

अशुद्धं ताम्रवायुर्ष्णं कांति वीर्यबलापहम्। वांतिमूर्च्छा भ्रमोत्क्लेदं कुष्ठं शूलं करोति तत्।।
उत्क्लेद भेद भ्रमदाहमोहास्ताम्रस्य दोषाः खलु दुर्धरास्ते।
विशोधनात्तद्विगत स्वदोषं सुधासमं स्याद्रसवीर्यपाके।। र.र.स. ५/४७-४८

Copper being a mineral origin product contains other natural contaminations, some of which are very toxic in effect. The *Tāmra* which is *Aśuddha* (impure) destroys the complexion, life span, and strength. It causes *Vamana, Mūrcha, Bhrama, Utkleṣa, Kuṣṭa* and *Śūla. Utkleśa, Atisāra, Bhrama, Dāha* and *Moha* are the dreadful effects arise out of impure *Tāmra*. However if *Tāmra* is subjected to proper *Śodhana,* all such toxic qualities will be neutralized and it becomes like *Amṛta* in its *Rasa, Vīrya* and *Vipāka.*

Śodhana

गोमूत्रेण पचेद्यामं ताम्रपत्रं दृढाग्निना। शुद्धयते नात्र सन्देहो मारणं चाप्यथोच्यते।।
र.र.स. ५/५२

The leaves of *Tāmra* if boiled in cows urine for 3 hours in intensive fire, it becomes *Śuddha* without any doubt.

Another method : Paste of *Snuhīkṣīra, Arka Kṣīra* and *Lavaṇa* may be applied over the copper leaves and then heated to red hot and may be applied over the copper leaves and then heated to red hot and may be dipped in *Nirguṇḍi juice* 3 times. Besides *Nirguṇḍi juice-snuhīkṣīra* and *Arka Kṣīra* may also be used for dipping. Some scholars recommend *gomūtra* mixed with *Āmla* and *Kṣāra* for this purpose.

Māraṇa

जम्बीर रस सम्पिष्टं रसगन्धक लेपितम्। शुल्बपत्रं शरावस्थं त्रिपुटैर्याति पंचताम्।। र.र.स. ५/५३

Purified *Pārada* and *Gandhaka* are grinded in juice of *Jambīra* and the paste is applied over the leaves of copper. These leaves then kept in *Śarāva saṁpuṭa* and subjected to 3 *Puṭas* to obtain the *Bhasma* of *Tāmra.*

अथवा मारितं ताम्रमम्लेनैकेन मर्दितं तद्गोलं सूरणस्यांते रुध्वा सर्वत्र लेपयेत्।।
शुष्कं गजपुटे पच्यात्सर्वदोषहरं भवेत्। वांति भ्रांति विरेकं च न करोति कदाचन।। र.र.स. ५/५४-५५

The *bhasma* of *Tāmra* is ground and the ball prepared out of it, is kept inside the tuber of *Sūraṇa,* closed the opening, covered with mud layer. It is then dried, kept in the *gajapuṭa* and heated. The obtainded *bhasma* alleviates all the *doṣa* and removes the blemishes such as vomiting, vertigo, and diarrhoea.

ताम्र पत्राणि सूक्ष्माणि गोमूत्रे पंचयामकं। क्षिप्त्वा रसेन भांडे तद्द्विगुणं देहि गंधकम्।।
अम्लपर्णी प्रपिष्याथ ह्यभितो देहि ताम्रकम्। सम्यक्निरुध्य भाण्डे तमग्निं ज्वालय यामकम्।।
भस्मीभवति ताम्रं तद्यथेष्टं विनियोजयेत्।। र.र.स. ५/५६-५८

The thin leaves of *Tāmra* are boiled in cow's urine (or kept in it) *Pārada,* equal to the quanity of *Tāmra* and *Gandhaka* its double the quantity, are taken and *Kajjali* is prepared. The *Kalka* (paste) out of *Amlapami* (Changeri) is applied over the above *Tāmra* leaves and dried. These leaves then, kept in

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a vessel in between (around) the *kajjali* prepared as above and the mouth of the vessel is covered. This vessel then is kept over the stove and heated in strong fire for 3 hours. This yields the *bhasma* of *Tāmra* which can be used where ever needed.

सूताद् द्विगुणितं ताम्रपत्रं कन्यारसैः प्लुतम् । पिष्ट्वा तुल्येन बलिना भांडमध्ये विनिक्षिपेत् ।।
छन्नं शरावकेणैतत्तदूर्ध्वं लवणं त्यजेत् । मुखे शरावकं दत्वा वन्हीं यामचतुष्टयम् ।।
अवचूर्णैव तच्छुल्बं वल्लमात्रं योजयेत् । पिप्पली मधुना सार्धं सर्वरोगेषु योजयेत् ।। र.र.स. ५/५९-६१

The leaves of *Tāmra, Pārada* double the quantity of *Tāmra* and *Gandhaka* equal to that of *Tāmra* are taken together and ground in juice of *Kumāri.* A ball is prepared out of it and taken in a vessel and a *śarāva* is placed over the ball. The remaining part of the vessel is filled with *Saindhava lavaṇa* and the mouth of the vessel is closed with another *śarāva.* It is the heated over the intensive fire 12 hours. After self cooling the *bhasma* is taken out and fine powder is made. If it is taken in the dosage of one *valla* (1 to $1^1/_2$ *ratti* 125 to 185 mg) along with the powder of *Pippali* and honey all the diseases are said to destroy.

Amṛtīkaraṇa

For this copper *bhasma* should be triturated with *Nimbu juice* and made into a mass to be kept inside *Sūraṇa* which is covered with clay and dried. Now a *Gajapuṭa* fire should he applied to it. If necessary this process may be repeated 2 or 3 times. In some texts *Pancāmṛta* is recommended for use in place of *Nimbu rasa* and *Sūraṇa* for *Amṛtikaraṇa.* It is also mentioned in the texts that by the process of *Amṛtīkaraṇa, Vānti, Bhrānti* etc. toxic effects are reduced or sometimes removed completely.

Pharmacological Properties

Rasa	:	*Tikta, kaṣāya.*
Guṇa	:	*Sīta, laghu, sara*
Vīrya	:	*Uṣṇa*
Vipāka	:	*Kaṭu*
Karma	:	*Kapha Pittahara, Lekhana, Alpabrumhaṇa, Hṛdvisodhana, Kṛmighna, Śodhana, Garahara, Rasāyana, Ropaṇa, Netrya.*
Effect on Doṣa	:	*Vātakaphahara, Pittakaphahara*

Therapeutic Uses

Pāṇḍu, Udara roga, Arśa, Gulma, Plīharoga, Yakṛd roga, Kṛmi, Śotha, Śūla, Udaraśūla, Pariṇāmaṣūla, Aṣṭavidhaśūla, Āmlapitta, Jwara, Swāsa, Kāsa, Kṣaya, Kuṣṭha, Pinasa, Agnīmāndya, Kṣayajaprameha, Grahṇī roga, Mūtrakṛcchra, Jīrṇajwara, Arocaka, Murcha, Āmadoṣa, Āmavāta, Vṛddhi, Sthaulya, Jarā and *Mrtyuhara, Viṣadoṣa.* Copper *Bhasma* is highly useful in *Kāsa, Swāsa, Jwara, Śūla* and *Hṛdroga.*

Formulations

Āmavateśwara rasa, Arogyavardhanivaṭi, Kañcanābhra ras, Kāsasaṁhārabhairava ras, Kṣyakeśari rasa, Gulmakālānal ras, Candrāmṛt rasa, Tāmra parpaṭi, Tāmreśwara rasa, Trivikram rasa, Nityānanda rasa, Pañcātmak rasa, Praṇavallabh ras, Mahodadhi rasa, Ravitāṇḍava ras, Lakṣmīvilāsa rasa, Vaḍavānala ras, Vātakhaṇṭak ras, Sarveśwara rasa, Hṛdayārṇava rasa.

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LOHA

Iron is known to Indians since ancient times, as in *Vedic* literature there are a number of references to this metal. But during that period it was used for commercial purposes only, its medicinal values came to be known only in later period, *i.e.,* from the time of *Āyurvedic Saṃhitās*. Its main mineral *gairika* is also known and used since ancient times. Ordinary iron is of light grey colour and possesses a metallic lustre. Its dorsal surface put under microscope after proper cleaning looks granular. The average effective dose of iron has been defined, as follows. That dose of iron which produces an average increase of at least 1 percent of haemoglobin per day in a sufficiently large group of patients with achlorhydria and anaemia. To produce a increase in haemoglobin percentage by 1% at least 25 mg of iron will have to be absorbed. It has been seen that during iron therapy concentration of Red Blood cells will increase more in comparison of Hb. Iron has low intermediate hardness, malleable and possess a light bluish colour. Specifically absorbs hydrogen gas and it can produce two type of salts, they are ferrous and ferric. The characteristic feature for differentiating ferrous and ferric form of iron is their charge. It can also produce coloured salt of iron. Iron provides stable and complex salts.

Śānskṛt	:	Loha
English Name	:	Iron
Hindi	:	Loha
Chemical Formula	:	Fe (Ferrum)
Atomic Number	:	26
Atomic Weight	:	66.85
Melting point	:	1520 °C
Boiling point	:	2950 °C
Hardness	:	4 to 5
Sp. Gr.	:	7.3 to 7.8

Synonyms

Ayas, Kālāyas, Loha, Āyas, Tīkṣṇak, Śastrak

Availability

Usually, iron is obtained from various iron oxide minerals, of which hematite, limonite, and magnetite are the most important ones. Sometimes, the sulphide minerals are also used for this purpose but in that case they are first converted into oxides before iron is extracted from them. The sulphide minerals are $CuFeS_2$ *(svarṇa mākṣika),* FeS *(raupya mākṣika),* and FeS_2 *(vimala).* But because of difficulty and cast iron was being obtained in India from hematite since ancient times. The best variety hematite yields 65 to 70% iron. In the process of extraction the mineral is mixed with charcoal and heated to separate metallic iron. In this process carbon, silicon, phosphorus and manganese are mixed with iron in traces. This is cast or pig iron which is not malleable, rather brittle. Important iron ores include hematite, limonite, magnetite and siderite which are oxides. Of these , hematite and limonite may be taken as varieties of *gairika* and magnetite may be taken as *kānta loha.* Siderite is occasionally used as iron ore as its iron content is very low (48%). Hematite contains highest percentage of iron, *i.e.,* 70%. It varies from red earthy powder to a dark compact shiny mass. Very large beds occur in Minnesota, Michigan, Wisconsin and in adjacent Canada. It occurs abun-

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dantly in India also. Its hardness is 1.5, sp. gr. is about 5 and its streak is cherry red. Limonite is yellow, soft and earthy or smooth, dark, compact, and rounded masses. Its iron content is about 60%. Its hardness is 1-1-5, sp. gr. is about 3.5, streak is yellow brown. It may be taken as *svarṇa gairika*. Magnetite is black and can be picked up easily by magnet. It is hard and heavy. Its hardness is 6, sp.gr. is 5.2, and its streak is black. It is found in crystals or masses in basic igneous rocks and metamorphosed sedimentary rocks. In India Salem mines of Tamil Nadu are famous for magnetite. It is found in the form of sand, plates or masses and has a metallic lustre. Pyrite, pyrrhotite and marcasite are the sulphide ores or iron. Iron is obtained from sulphide ores with difficulty.

The properties of different types of ores of iron with its percentage.

S.No.	*Name of Ore*	*ChemicalFormula*	*Percentage of Iron*
1.	Maganetite	Fe_3O_4	72.
2.	Haematite	Fe_2O_3	470.059.
3.	Limonite	$Fe_2O_3 . H_2O$	848.
4.	Siderite	$FeCO_3$	246.6
5.	Pyrites	FeS_2	1.17

Varieties

Three main varieties of *loha* are mentioned in *Rasa* texts and these are :

A. *Muṇḍa* - ordinary - cast iron,

B. *Tīkṣṇa* - better - steel,

C. *Kānta* - best - magnetic iron.

Each of these three is described to have some subvarieties, such as :

A. *Muṇḍa loha* - 1. *Mṛdu,*
2. *Kuṇṭha,*
3. *Kaḍāra.*

B. *Tīkṣṇa loha* - 1. *Khara,*
2. *Sāra,*
3. *Hṛnnāla,*
4. *Tārāvaṭṭa*
5. *Vājira,*
and 6. *Kālaloha.*

C. *Kānta loha*- This has been divided on the basis of colour, magnetic effects and magnetic poles.

On the basis of colour :

1. *Pīta* - *vedhakara,*
2. *Kṛṣṇa* - *rasāyana,*
3. *Rakta* - *Bandhakara*

On the basis of magnetic effect :

1. *Bhrāmaka* - *inferior*

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2. *Cumbaka* - *ordinary*
3. *Karṣaka* - *superior*
4. *Drāvaka* - *most superior*
5. *Romaka* - *most superior*

On the basis of magnetic poles :

1. *Ekamukha* - *inferior*
2. *Dvimukha* - *ordinary*
3. *Trimukha* - *ordinary*
4. *Caturmukha* - *superior*
5. *Pañcamukha* - *most superior*
6. *Sarvatomukha* - *most superior*

Physical properties :

(A) *Muṇḍa loha– Muṇḍa loha* is malleable, having a melting point of 1200^{0}C which is much lower than the same of other varieties of iron. Hence in *Āyurveda* it is called *druta drāva.* In addition to iron it may contain upto 4% carbon, silicon, manganese, phosphorus and sulphur. It is mainly used for making iron pots of daily uses. Its varieties are based on its malleability.

(B) *Tikṣṇa loha– Tikṣṇa loha* is a type of steel which is made from pig iron after removing some of the impurities. Many types of steel are made by reducing or removing the carbon content of iron. In some cases chromium, manganese and nickel may also be mixed in different proportion. Each of the three varieties of *tīkṣṇa loha* mentioned in ancient texts is claimed to be better than the preceding one. Till now it is not possible to find out their modern equivalents and these cannot be explained in modern terms.

Best quality *tīkṣṇa loha* -

According to *Āyurveda Prakāśa* best *tikṣṇa loha* is that which on rubbing with the paste of *kāsisa* and *āmalakī* and subsequent washing becomes so bright that one can see his image in it.

आयुष्प्रदाता बलवीर्यकर्ता रोगप्रहर्ता मदनस्यकर्ता।
अयः समानं न हि किंचिदन्यद्रसायनं श्रेष्ठतमं हि जंतोः।। र.र.स. ५/१४९

(C) *Kānta loha– Kānta loha* is magnetic iron obtained from magnetic iron ore. It is the best of all the three varieties or iron. It is highly useful in *rasakarmas* (mercurial operations) and *rasāyana karmas* (rejuvenation and therapeutic purposes). It is claimed to be the best restrainer for mercury, like an *aṅkuśa* (iron hook) for elephant. The varieties of *kānta loha* starting from *bhrāmaka* down to *romaka* are based on their respective magnetic power. As such, the *cumbaka and romaka* varieties possess better magnetic power. Its magnetism is influenced greatly by exposure to sun and atmosphere. Hence, it should be protected from their effects and should be collected from deep places.

According to the texts best *kānta loha* is that which does not allow oil drops to spread on water surface, neutralises the bitterness of *nimbapatra* paste, destroys the smell of *hiṅgu* and holds the boiling milk from spilling out of the vessel and allows it to attain a *śikharākāra* (tower shape).

Need for Śodhana

According to *Āyurveda Prakāśa* there are seven types of *doṣas* in *loha dhātu*, viz., *gurutva* (heavi-

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ness), *dṛḍhatva* (stiffness), *utkleda* (nauseating tendency), *glāni* (timidness), *dāha kāritva* (causing burning sensation), *aśmadoṣa* (leading to calculus formation), and *durgandhatā* (bad smell). Hence *loha* should be used after proper processing. The above mentioned *doṣas*, of *loha* are considered to be *svābhāvika* (natural). Besides these *doṣas* unprocessed *loha* may cause the following diseases also, *viz., vandhyātva* (sterility), *kuṣṭha* (skin lesions), *hṛd roga* (cardiac problems), *śūla* (colic), *aśmārī* (calculous), *hṛllāsa* (nausea) and *mṛtyu* (death) and also *balabuddhināśa* (destruction of strength and intelligence), *śarīra paṭutānāśana* (loss of energy), *prāṇaharaṇa* (loss of vitality), *mada janana* (intoxication), *śūla janana* (induction of pain), *sundaratā nāśana* (destruction of beauty/complexion). Thus, its purification with *śodhana* and *māraṇa* processes is highly essential.

Śodhana

तत्पानि सर्वा लौहानि कदलीमूलवारिणि। सप्तधा त्वभिषिक्तानि शुद्धिमायान्त्यनुत्तमाम्।। र.स.स.
शाखाश्रितं कोष्ठसमाश्रित वापित्तं विवृद्धन्तु मलाभिधेयम्।
मृतन्तु लोहं शमयेन्नितान्तं यथा समीरः खलु मेघवृन्दम्।। र.त. २०/९७
शतोत्थमुत्तत्तं किट्ट मध्यं चाशीतिवार्षिकम्। अधमं शष्टिवर्षीयं ततो हीन विषोपमम्।।
आ. प्र. ३/२९०

Drugs– Taila, takra, gomūtra, kāñjī, kulattha kaṣāya for general purification and *triphalā kvātha, ciñcāpatra rasa, kadalīmūla jala, kṣīra* for special purification.

Method– Heating to red hot and then dipping into the prescribed liquids for prescribed times.

1. Generally, heating of iron foils is done without any pasting but in some cases pasting of *samudra lavaṇa* and rabbit's blood is recommended before heating.

2. Some scholars suggest the use of *gomūtra* instead of water for preparing *triphalā kvātha.*

3. By treating the heated iron foils alternately in acidic and alkaline liquids or in the mixture of both the dis-integration of iron particles is achieved.

Māraṇa

भानुपाकात्तथा स्थालीपाकाच्च पुटपाकतः। निरूत्थो जायते लौहो यथोक्तफलदो भवेत्।।
र.र.स. १/३०८

चूर्णीकृतं तुष्मण्डूरं त्रिफलाक्वथिताम्भसा। सम्पेष्य सम्पुटे कृत्वा त्रिंषद्धारं ततः पुटेत्।।
एवं नातिचिरादेव रक्तचन्दनसप्रभम्। मण्डूरं जायते तूर्ण तो योगेषु योजयेत्।।
लोहमारकगणोदितैस्तु तैर्भेषजैरपि सह प्रपेशितम्।
लोहकिट्टमथ सम्पुटीकृतं पाचितं खलु समेति पश्ताम्।। र.त. २०/१२९-१३१

Drugs – Minerals-mercury, sulphur, cinnabar
Herbs-*Eraṇḍapatra, goghṛta, mitra pañcaka*

Bhāvanā drugs– Triphalā kvātha, kumārī rasa, bhṛṅgarāja rasa, kaṇṭakāri rasa, adrikaṃī rasa, matsyākṣī rasa, āmatinduka rasa, gomūtra.

Process– Bhānupāka, sthālīpāka, puṭapāka, niragnipāka.

Types and number of puṭas : Gajapuṭa seven to one hundred *puṭas.*

Type of heat–Sūryatāpa : two yāma to three days

Dhānyarāśi pāka : three to fourteen days.

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Agnitāpa : four *prahara (Rajahastamita garta Pūrāṇa).*

Apparatus– Tāmrapātra, bhāṇḍayantra, sthālīyantra, kaṭāhayantra, śarāva sampuṭa.

Colour of bhasma– Jambūphalābha, rakta/sindūrābha, gṛhadhūmavat. Red colour is due to the formation of iron oxide on account of heating for a number of times. *Pakva jambūphala* like colour is due to the mixture of red and black colours. This colour is mentioned for *kāntaloha bhasma. Gṛhadhūma* like colour is found in the *loha bhasma* which is prepared without a treatment with fire. It may be due to the presence of black sulphide of mercury as in this process *kajjalī* is mixed with iron and heat is applied through *dhānyarāśi* or sun rays.

Amongst all the *loha bhasmas, kānta loha bhasma* is considered superior most. It is also said about *loha bhasma* that there is no better *rasāyana* drug in the world than *loha.*

Amṛtīkarṇa

This is a part of *māraṇa* process and is done to remove the remaining *doṣas* (bad effects) or to induce some special properties in the *bhasma.* In case of *lohabhasma* it is done with equal or double quantity of *triphalā kaṣāya.* The *lohabhasma* is ground and heated with *triphalā kaṣāya* after completing *puṭapāka* so as to make it more effective.

Muṇḍa Loha

Rasa	-	*Tikta, kaṣāya, madhura*
Guṇa	-	*Guru, rūkṣa*
Vīrya	-	*Śīta*
Karma	-	*Agnipradīpi, koṣṭha śodhi, rudhirakṛt*
Doṣa prabhāva	-	*Kapha vātahara*
Vyādhi prabhāva	-	*Prameha, kāmalā, pāṇḍu, gulma, āmavāta, jaṭharārti, śopha, āmaśūla, āmakapha, dāha, śoṣa, kuṣṭha, rakta roga.*

Tīkṣṇa Loha

Rasa	-	*Tikta*
Guṇa	-	*Śīta, rūkṣa, uṣṇa also.*
Vīrya	-	*Śīta/uṣṇa*
Karma	-	*Dīpana, rasāyana, balakara, sadyaḥśulahara*
Doṣa prabhāva	-	*Kaphapittakara*
Vyādhi prabhāva	-	*Śula, yakṛt vikāra, plīha roga, jaṭhara roga, āmaśūla, pāṇḍu, kṣaya, kuṣṭha, jarāvyādhi, arśa, prameha, āmavāta,* medoroga.

Sāra Loha

Rasa	-	*Tikta, kaṣāya*
Guṇa	-	*Guru, rūkṣa*
Vīrya	-	*Śīta*
Doṣa prabhāva	-	*Pittanāśaka*
Vyādhi prabhāva	-	*Chardi, śvāsa, kāsa, grahaṇī, pīnasa, atisāra, prameha, pariṇāma śūla, ardhāṅga vāta, sarvāṅga vāta.*

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Kānta Loha

Rasa	-	*Tikta*
Guṇa	-	*Snigdha, śita/uṣṇa*
Vīrya	-	*Śīta/uṣṇa*
Karma	-	*Balavīrya vardhaka, agnivardhaka, cirāyukara, rasāyana, vṛṣyatama, ojovardhaka, tejovardhaka, dṛṣṭivardhaka, kāntijanana, śarīravṛddhikara, samasta rogahara.*
Doṣa prabhāva	-	*Tridoṣa śamana*
Vyādhi prabhāva	-	*Śopha, pāṇḍu, kāmalā, halīmaka, jarāroga, kṣaya, aṣṭādaśakuṣṭha, gulma, udaraśūla, arśa, bhagandara, udararoga, yakṛd pliha roga, amlapitta, āmavāta, āmadoṣa, prameha, śīrorujā, vandhyātva, samasta roga.*

Pharmacological Properties of Loha

Rasa	-	*Tikta, kaṣāya, madhura.*
Guṇa	-	*Śita, sara, guru, rūkṣa*
Vīrya	-	*Śita (uṣṇa according to Rasa Kāmadhenu).*
Karma	-	*Lekhana, balya, vṛṣya, rasāyana, vayasya, cakṣuṣya, vājīkara, yogavāhī, rudhirakṛt, koṣṭha śodhi, vīryakṛt, putraprada, prabhūtaguṇakṛt, madana sañjanana.*
Effect on Doṣa	-	*Anilāpaha, ślesmahara, tridoṣahara.*

Therapeutic Uses

Śotha, śula, arśa, pāṇḍu, kāmalā, kṛmi, śoṣa, pliha roga, medoroga, kuṣṭha roga, jarā roga, rudhira roga, gulma roga, udara roga, hṛd roga, śleṣma roga, śvāsa, kāsa, prameha, grahaṇī, jvara, āmavāta, bhrama, kṣīṇatva, pinasa, vami, aruci, vandhyātva, malaja roga, mṛtyu.

Iron Metabolism

The body of a healthy adult contains 4-5gm of iron in the following forms.

1. Blood haemoglobin contain about 2.5 gm (45m mol) of iron.
2. Storage iron amounts to 1-1.5 gm in which (2/3 as ferritin and 1/3 as haemosiderin).
3. Myoglobin in red muscles (muscles which are engaged in slow repeated contractions e.g. leg muscles and cardiac muscles of large mammals) contains 0.2 gm of iron.
4. Intracellular enzymes containing iron protoporphyrins, including cytochrome oxidase. Catalase, peroxidase and cytochrome account for less than 0.1 gm of iron.

Iron Balance

The intracellular iron- containing enzymes and myohaemoglobin are stable substances of iron which can not be called upon for other purposes. On the other hand destruction of blood haemoglobin is a continuous process. The iron content of haemoglobin is 0.33%. Thus 100 ml of blood containing 15 gm of haemoglobin contain 50 mg of iron.

The iron loss, and in consequence the need for food iron, is greater in women than in men because of the blood loss during the monthly menstrual period and during pregnancy. Following data

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show the loss of iron during pregnancy and lactations.

(i) Iron content of fetus at term	=	400 mg
(ii) Iron content of placenta and uterus	=	150 mg
(iii) Iron content of blood loss at delivery	=	170 mg
(iv) Iron content of milk during lactation	=	180 mg
(v) Total iron loss in 15 month	=	900 mg
(vi) Average daily loss	=	2 mg

Intake of Iron

Normally, adequate amounts of iron occurs in a mixed diet, food stuffs vary both in their content of iron and the availability of iron for absorption into the body. The iron in foods of animal origin is better absorbed than iron in foods of vegetable origin . About 10 percent of dietary iron is absorbed and converted to haemoglobin.

Many factors influence the absorption of iron from the gut.

1. Absorption of iron occurs mainly from the duodenum and upper jejunum. It takes place via the brush border of the intestinal mucosa into the bood stream(not lymph).
2. Ferrous iron (Fe^{++}) is better absorbed than ferric (Fe^{+++}) iron reducing substances, such as ascorbic acid, enhance iron absorption by converting ferric to ferrous.
3. The presence of phospate in foods may reduce ionic iron absorption by forming insoluble iron salts.
4. Haem is absorbed directly i.e. without splitting off of iron from protoporphyrin.
5. Non-haem iron absorption is favoured buy presence of acide such as HCl from stomach.
6. Decrease in iron stores in the body, enhance iron absorption.
7. Due to exposure of hypoxia at high altitude erythropoiesis increase hence it enhance the absorption of iron.
8. On the other hand, an increase in iron storage in the body reduces iron absorption by the gut mucosa.

The iron requirement of a normal adult male is about 5-10 mg per day. Women up to menopausal age requires more about 15 mg per day rising up to 20 mg during pregnancy and lactation. Requirement of iron in children are about 0.5 mg per kg body weight.

In diseases such as various infection, iron requirement are increased due to

(i) Reduced absorption in the gut.

(ii) Decrease in concentration of plasma iron.

(iii) Diminished capacity for synthesis.

The iron content of various foods are as follows

Liver	:	15 mg %
Meat	:	2-5 mg%
Fish	:	1 mg%
Chicken	:	2 mg%
Milk	:	0.2 mg%

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Egg	:	3 mg.

Iron from vegetable sources

Pears	:	6-10 mg.%
Beans	:	6-10 mg%
Green leavs	:	4.8 mg%
Spinach	:	5 mg%
Whiteflour	:	1-5 mg%
Potatoes	:	1-2 mg%

Excretion of Iron

In an adult man who is taking adequate iron intake, excretion of iron is only 0.4 mg daily in the urine and about 0.8 mg in the bile. A very little amount is excreted through mucosa of alimentary canal. It is claimed that the loss of iron in perspiration in hot climates may be equivalent to loss of iron during a menstrual bleeding in a day. The amount of iron found in the stools mainly represents the unabsorbed food iron.

Formulations

Āgnikumār Rasa, Kāñcanābhra rasa (bṛhad), Kṣayakeśari Rasa, Caturmukha Rasa, Candraprabha Vaṭi, Candrāmṛta Rasa, Cintāmaṇi Rasa, Dhātri Lauha, Navāyas Lauha, Naynāmṛta Lauha, Pradrāntaka Lauha, Puṭpakvaviṣamajvarāntak Lauha, Mṛtyuñjya Lauha, Yakṛtplīhāri Lauha, Ladhvānand Rasa, Lauha parpaṭi, Varuṇādya Lauha, Vātakaṇtak Rasa, Vataraktāntak Rasa, Saptāmṛta Lauha.

Candanādi Lauha

रक्तचन्दनह्रीवेरपाठोशीरकणाशिवा नागरोत्पलधात्रीभिस्त्रिमदेन समन्वितः ।
लौहो निहन्ति विविधान् समस्तान् विषमज्वरान् । (भै. र. ज्वर चिकित्सा प्रकरणम् ५/११४५)

Ingredients

1. Rakta candana	-	*42 gm*
2. Hrībera	-	*42 gm*
3. Pāṭha	-	*42 gm*
4. Uśīra	-	*42 gm*
5. Pippali	-	*42 gm*
6. Harītaki	-	*42 gm*
7. Śuṇṭhi	-	*42 gm*
8. Utpala	-	*42 gm*
9. Āmalaki	-	*42 gm*
10. Musta	-	*42 gm*
11. Citraka	-	*42 gm*
12. Viḍanga	-	*42 gm*
13. Lauhabhasma	-	*504 gm*

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Dose : 250-500 mg

Anupāna : *Madhu*

Therapeutic Uses

Viṣamajwara, Jīrṇajwara.

Navāyas Loha

ज्यूषणत्रिफलामुस्तविडङ्गचित्रका: समा: । नवायोरजसो भागास्तच्चूर्ण मधुसर्पिषा ।।
भक्षयेत् पाण्डुहृद्रोगकुष्ठार्श : कामलापहम् ।। (भै. र. पाण्डु रोग चिकित्सा प्रकरणम् १२/ २८)

Ingredients

1. Śuṇṭhi	-	*560 gm*
2. Marīca	-	*560 gm*
3. Pippali	-	*560 gm*
4. Āmalaki	-	*560 gm*
5. Harītaki	-	*560 gm*
6. Vibhītaki	-	*560 gm*
7. Nāgaramotha	-	*560 gm*
8. Vayuvidanga	-	*560 gm*
9. Citraka	-	*560 gm*
10. Lohabhasma	-	*5040 gm*

Dose : 4-6 *ratti*

Anupāna : *Madhu, Ghṛta*

Therapeutic Uses

Pāṇḍuroga, Hṛdroga, Kuṣṭa, Arśa, Kāmala.

Pradarāntaka Lauha

लौह ताम्रं हरीतालं वंगमभ्रं वराटिका। त्रिकटु त्रिफला चित्रं विडंगं पटुपन्चकम् ।।
चविका पिपली शखं वचा हपुषपालकम्। शटी पाठा देवदारू एला च वृद्धदारकम् ।।
एतानि समभागानि संचूर्णर्य वटिकां कुरू। (भै. र., स्त्रीरोगाधिकार ७५-७६ १/२)

Ingradients

1. Lauha Bhasma	-	*340gm*
2. Tāmra Bhasma	-	*340gm*
3. Haratāla Bhasma	-	*340gm*
4. Vanga Bhasma	-	*340gm*
5. Abhraka Bhasma	-	*340gm*
6. Varāṭika Bhasma	-	*340gm*
7. Śuṇṭhi	-	*340gm*
8. Marīca	-	*340gm*
9. Pippali	-	*340gm*

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10. Harītaki	-	*340gm*
11. Vibhitaki	-	*340gm*
12. Āmalaki	-	*340gm*
13. Citraka	-	*340gm*
14. Viḍanga	-	*340gm*
15. Saindhava Lavaṇa	-	*340gm*
16. Samudra Lavaṇa	-	*340gm*
17. Viḍa Lavaṇa	-	*340gm*
18. Sauvarcala Lavaṇa	-	*340gm*
19. Audbhida Lavaṇa	-	*340gm*
20. Cavya	-	*340gm*
21. Pippali	-	*340gm*
22. Śankha Bhasma	-	*340gm*
23. Vaca	-	*340gm*
24. Hapuṣa	-	*340gm*
25. Kuṣṭha	-	*340gm*
26. Ṣathi	-	*340gm*
27. Pāṭha	-	*340gm*
28. Devadāru	-	*340gm*
29. Ela	-	*340gm*
30. Vṛddha dāru	-	*340gm*

Dose : 500 mg.

Anupāna : *Śarkara, Madhu, Ghṛt.*

Therapeutic Uses

Agnimāndya, Śūlaroga, Pāṇḍu, Pradara.

Puṭapakva Viṣama Jvarāntak Lauha

हिंगुलसम्भवं सूतं गन्धकेन सुकज्जलम्। रसपर्पटीवत् पाच्यं सूताङ्घ्रि हेमभस्मकम्।।
लौहं ताम्रमभ्रकन्च रसस्य द्विगुणं क्षिपेत्। बंग चैव प्रवालन्च रसादर्धच्च विनिक्षिपेत्।।
मुक्ता शंखं शुक्तिभस्म रसपादिकमेव च। मुक्तागृहे च संस्थाप्य पुटपाकेन साधयेत्।

(रसेन्द्रसारसंग्रह, ज्वराधिकार: २७१-२७३)

Ingradients

1. Hingulotha Pārada	-	*1kg*
2. Śuddha Gandhak	-	*1kg*
3. Swarna Bhasma	-	*250 gm*
4. Lauha Bhasma	-	*2kg*
5. Tāmra Bhasma	-	*2kg*
6. Abhraka Bhasma	-	*2kg*

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7. *Vanga Bhasma* - *500gm*
8. *Pravāla Bhasma* - *500gm*
9. *Mukta Bhasma* - *250gm*
10. *Śankha Bhasma* - *250gm*
11. *Śukti Bhasma* - *250gm*

Dose : 250 mg.

Anupāna : *Pippali, Hingu, Saindhava, Madhu, Guḍūci Swaras, Sephali Swarasa.*

Therapeutic uses

Grahaṇi, Gulma, Pliharoga, Yakṛdroga, Kāmala, Pāṇḍu, Śotha, Viṣamajvara, Jīrṇajvara.

Saptāmṛtaloha

मधुक त्रिफलाचूर्णमयोरजः समं लिहन्। मधुसर्पिर्युत सम्यक् गव्य क्षीरं पिवेदन्।।

(भै. र. शूलरोगाधिकार ८३)

Ingredients

1. *Yaṣṭimadhu* - *210 gm*
2. *Haritaki* - *210 gm*
3. *Vbhitaki* - *210 gm*
4. *Āmalaki* - *210 gm*
5. *Lohabhasma* - *210 gm*

Dose : 250mg

Anupāna : *Madhu, Ghṛta, Go-dugdha*

Therapeutic Uses

Śūla, Āmlapitta, Jwara, Mūtrasanga, Timira.

Śatamūlyadi Loha

शतमूलीसिताधान्यनागकेशरचन्दनैः। त्रिकत्रयतिलैर्युक्तं लौहं सर्वगदापहम्।।
तृष्णादाहज्वरच्छर्दिरक्तपित्तहरं परम्।। (भै. र. रक्तपित्त चिकित्सा प्रकरणम् १३/ ७५-७६)

Ingredients

1. *Śatāvari* - *34 gm*
2. *Śarkara* - *34 gm*
3. *Dhaniya* - *34 gm*
4. *Nāgakeśar* - *34 gm*
5. *Rakta candana* - *34 gm*
6. *Śuṇṭhi* - *34 gm*
7. *Marīca* - *34 gm*
8. *Pippali* - *34 gm*
9. *Āmalaki* - *34 gm*

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10. Haritaki	-	*34 gm*
11. Vibhitaki	-	*34 gm*
12. Vāyuviḍanga	-	*34 gm*
13. Nāgaramotha	-	*34 gm*
14. Citrak mūla	-	*34 gm*
15. Tila bija	-	*34 gm*
16. Lohabhasma	-	*510 gm*

Dose : 3 Ratti

Anupāna : *Water*

Therapeutic Uses

Triṣṇa, Hastapādādidāha, Paittikajwar, Chardi, Raktapitta.

Yakṛdāri Loha

द्विकर्ष लौहचूर्णस्य गगनस्य, पलार्द्धकम्। कर्ष शुद्धं मृतं ताम्रं लिम्पाकाङ्घ्रत्वचः पलम्।।
मृगाजिनभस्मपलं सर्वमेकत्र कारयेत्। नवगुञ्जाप्रमाणेन वटिकां कारयेद्भिषक्।।
यकृत्प्लीहोदरन्चैव कामलाञ्च हलीमकम्। कासं श्वासं ज्वरं हन्ति बलवर्णाग्निवर्द्धनम्।।
राकृदरिनाम लौहं सर्वव्याधिनिषूदनम्।। (भै. र. प्लीहयकृद्रोग चिकित्सा प्रकरणम् ४१/ १२९-१३१)

Ingredients

1. Lauha bhasma	-	*26.59 gm*
2. Abhraka bhasma	-	*26.59 gm*
3. Tāmra bhasma	-	*13.29 gm*
4. Nimba Bark	-	*16.62 gm*
5. Mṛgacharma bhasma	-	*16.62 gm*

Dose : 9 rati

Anupāna : Water

Therapeutic uses

Plihavṛdhi, Udararoga, Kāmala, Halīmaka, Kāsa, Śwāsa, Jwara.

MAṆḌŪR

It is said to be *loha mala* or *loha kiṭṭa* which means it gets its origin from *loha* (iron) as a by-product. According to *Āyurveda prakāśa* it is a *mala* (slag) of iron produced on heating.

According to modern science *maṇḍūra* is iron oxide produced naturally. A rust is formed on the outer surface of iron when it is exposed to sun, air, and moisture. This rust separating out in course of time is known as *Maṇḍūra*. This process continues for a long time and thus the iron goes on rusting, leading to its complete conversion into the rusted form. Ancient scholars observed this and gave the name *loha kiṭṭa* or *mala* to the rust. In real sense it is the result of slow chemical reaction which helps the conversion of iron into iron oxide due to the effect of atmosphere. *Maṇḍūra* formation is a very slow process and takes years to complete the reaction. Probably because of this the ancient scholars recommended that *maṇḍūra* older than one hundred years is the best as in very old samples of *maṇḍūra*

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the chances of the presence of unreacted iron are very low. Probably because of this reason it is said in *Rasa* texts that *maṇḍūra* could be used after purification only and its *māraṇa* is not necessary; as in the *māraṇa* process iron is treated in such a way that it becomes converted into iron oxide in comparatively much less time. During *māraṇa* treatment the conditions necessary for the required chemical reactions are created artificially with a view to allow this reaction to proceed quickly. In this reaction two atoms of iron are combined with three atoms of oxygen and the product formed is Fe_2O_3.

Śānskṛt	:	*Maṇḍūra*
English Name	:	*Rusted iron*
Hindi	:	*Maṇḍūr*
Chemical Formula	:	Fe_2O_3

Acceptable variety

The *maṇḍūra* which is heavy, smooth, hard, without fissures and older than hundred years is considered superior. It is said in *Rasendra Cintāmaṇi* that *kiṭṭa* older than one hundred years is the best, older than eighty years is medium and older than sixty years is inferior; and if it is less than sixty years old it should be discarded as such *kiṭṭa* is considered as *viṣa* (poison) probably because of the presence of high percentage of unreacted metallic iron.

Properties according to the variety of iron of origin

1. *Muṇḍa kiṭṭa* - Slightly red, heavy and smooth
2. *Tīkṣṇa kiṭṭa* - Black like broken piece of *añjana*, heavy without cracks, holes and fis sures.
3. *Kānta kiṭṭa* - Yellowish, rough, very heavy, without fissures and shining like silver or fracture or cut.

Pharmacological Properties

मण्डूरं सुमृतं वृष्यं शिशिरं रूचिरं परम्। दीपनं पित्तशमनं रक्तवृद्धिकरं परम्।।
पाण्डुप्रमत्तमातङ्गमदमर्दनकेशरी। कामलाकुञ्जकुलिशं मण्डूरं तु विशेषतः।।
शोषप्रशमनश्चैव तथा शोफप्रणाशनम्। हलीमकं च प्लीहानं मण्डूरं हन्त्यशेषतः।।

र.त. २०/१३२-१३४

Rasa	:	*Kaṣāya*
Guṇa	:	*Śiśira*
Vīrya	:	*Śīta*
Karma	:	*Vṛṣya, rucikara, dīpana, śīta pitta śamana,* and *rakta vṛddhikara.* All the *Karmas* attributed to *loha* are said to be found in *loha kiṭṭa* also.

Śodhana

Drugs : Gomūtra, triphalā kwātha, triphalā kvātha prepared in *gomūtra.*

Method : Heating to red hot in *akṣāṅgāra* and dipping into *gomūtra* or *triphalā kvātha.* The process is repeated seven or eight times or till it becomes *jīrṇa* (completely converts into powdery form). The author of *Āyurveda Prakāśa* recommends the vessel made of *akṣakāṣṭha* for keeping the liquid used for *śodhana.* Some scholars suggest that after heating and dipping *maṇḍūra* should be boiled in double the *triphalā kvātha,* fired and then powdered and used. As regards the number of

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operation of the process it may be said that if the *maṇḍūra* is of superior quality it needs less heating and dipping but if it is of inferior variety it may need more heating and dipping.

Māraṇa

Generally, *māraṇa* is not necessary for *maṇḍūra*. However, some texts mentions the method of its *māraṇa*. *Maṇḍūra māraṇa* methods are mentioned in *Rasa Kāmadhenu, Rasāmṛtam* and *Rasa Taraṅginī*.

चूर्णी कृतं तुमण्डूरं त्रिफलाक्वथिताम्भसा। सम्पेष्य सम्पुट कृत्वा त्रिषद्वारं ततः पुटेत्।।
एवं नातिचिरादेव रक्तचन्दनसप्रभम्। मण्डूरंजायते चूर्ण ततौ योगेषु योजयेत्।।

(रसतरंगिणी, तरंग २०, १२९-१३०)

Ingredients

1. *Mandūr*
2. *Triphala Kwāth*

Method : Mandūr bhasma is prepared by giving 30 *gajapuṭas* and *bhāvana* is given with *triphala kwāth*.

Bhāvaṇa : Triphalā kvātha, kumārī rasa, laśuna rasa. Maṇḍūra māraṇa methods are mentioned in *Rasa Kāmadhenu, Rasāmṛtam* and *Rasa Taraṅgiṇī*.

Colour of bhasama : Red like *rakta candana*.

Therapeutic Uses

Pāṇḍu, kāmalā, kumbha kāmalā, halīmaka, śopha, śvayathu, plīharoga, śoṣa, raktakṣaya, Yakṛtvṛddhi. It is said about *muṇḍa kiṭṭa* that all the properties mentioned for *muṇḍa loha* are also found in *muṇḍa kiṭṭa*.

Dose : 250-500mg

Anupāna : *Madhu, Triphala kwāth, Punarnvāṣṭak kwāth, punarnava swaras.*

Punarnavā Maṇḍūr

पुनर्नवा त्रिवृद् व्योषविडगं दारू चित्रकम् कुष्ठं हरिद्रे त्रिफला दन्ती चव्यं कलिंगकाः पिप्पली पिप्पलीमूल मुस्तं पलोन्मितम्।। मण्डूरं द्विगुण गोमूत्रे द्वयाढके पचेत। कोलबद गुडिकाःकृत्वा तकेणालोड्यना पिवेत्।।

(चरकसंहिता, चिकित्सास्थान, अध्याय-१६, ९३-९५)

Ingredients

1. Punarnavā	-	*166gm*
2. Trivṛt	-	*166gm*
3. Śuṇṭhi	-	*166gm*
4. Pippali	-	*166gm*
5. Marica	-	*166gm*
6. Vāyuviḍanga	-	*166gm*
7. Devadāru	-	*166gm*
8. Citraka	-	*166gm*
9. Puṣkarmūla	-	*166gm*

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10. Triphala	-	*166gm*
11. Haridra	-	*166gm*
12. Dāruharidra	-	*166gm*
13. Danti	-	*166gm*
14. Cavya	-	*166gm*
15. Indrayava	-	*166gm*
16. Kuṭaki	-	*166gm*
17. Pippali	-	*166gm*
18. Pippalimūla	-	*166gm*
19. Motha	-	*166gm*
20. Mandūr bhasma	-	*6662gm*
21. Gomūtra	-	*q.s.*

Dose : 2-4 Ratti.

Therapeutic Uses

Pāṇḍu, Śotha, Udar roga, Ānah, Śūla, Arśa, Kṛmiroga, Gulma.

NĀGA

According to the ancient texts lead is said to have originated from the semen of *Vāsukī* (the king of snakes) which he discharged on seeing the young and beautiful daughter of *Bhogī* (another king of snakes). Lead is a dark-white and very soft metal which may be scrapped even by nails. When rubbed on paper lead yields black lines. Though the metal is brittle, thin sheets can be prepared from it. It is not affected by pure water and dry air but in impure water it is slightly corroded. The metal was known to our ancients since Vedic times. It is obtained in two forms, native lead (rare) and mineral lead (common). Lead is generally obtained from galena (lead sulphide PbS). Though there are more than a dozen lead minerals, only two of them are important. Both are secondary minerals and obtained from galena by slow action of air and moisture. It usually contains small quantities of silver and antimony. It is used for many purposes in industry but for medicinal purposes it should be used with care as its prolonged use may cause lead poisoning due to cumulative effect. Lead is highly malleable, it can be hammered or pressed into thin sheets. It has less ductility i.e. cannot be easily drawn into wire. When scratched, it makes a black streak on paper. Lead is a poor conductor of electricity. It resists corrosion by water and by sulphuric acid and by other powerful chemicals.

Śānskṛt	:	*Nāga*
English Name	:	Lead
Hindi	:	Sīsa
Latin	:	Plumbum
Chemical Formula	:	Pb
Hardness	:	1.5
Sp. Gr.	:	11.3
Melting Point	:	326 °C to 335 °C
Boiling Point	:	1525 °C

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Density : 11.35 grams per cubic centimeter at 20 ^{0}C

Synonyms

Bhujaṅga, druta drāvī, Mṛdūttamam, suvarṇāri, yakṣma dhātu, Ranjakam. Mahābhāram pūtigandham, bahihśyāmam, Sisaka, Sisa, Nāgaka, Aṣiviṣa, kuvaḍuka, Kuranga and Sindūra kāraṇam etc.

Availability

Nearly all lead ores are produced from mines. Many minerals contain lead, but the principal source of the element is Galena (PbS), a grey metallic ore. In its pure form, galena consists of only lead and sulphur. However, it rarely occurs in such a form in nature. Instead, most deposits of galena contain some copper, gold, silver and zinc. The other ores of lead include Anglesite ($PbSO_4$) and Cerussite ($PbCO_3$). The occurrence of lead is widespread. It is found in soviet Union, Australia, America, Canada, Mixcico and Peru. In India the lead mines are at Madras, Uttar Pradesh and Rajasthan.

Extraction

A good quality *galena* when heated with controlled heat, first forms lead oxide. It is called the method of air reduction.

Most lead ores contain silver, and this metal is obtained from the lead by cupellation, repeated melting and crystallization, alloying with Zinc, or by electrolytic Process. Sphalerite or blende is frequently associated with galena and the presence of Zinc causes difficulties in melting.

Appearance

Lead is a bluish grey, heavy metal, freshly cut surface of which shows a bright metallic lustere, which is however quickly lost on exposure to air. Due to oxidisation it is soft, may be scatched with the finger nail, and makes a black streak on paper. When heated, it emits a foul odour.

Varieties

Ayurvedic texts have mentioned two varieties of lead as *Kumāra* and *Śabala* or *Śamala*. No description about their individual properties or differences is available. It is not mentioned which variety is superior or inferior and hence, both of them are used.

Acceptable variety

द्रुतद्रावं महाभारं छेदे कृष्णसमुज्ज्वलम्। पूतिगन्धं बहिः कृष्णं शुद्धं सीसमतोऽन्यथा।।

र.र.स. ५/१७०

According to Ayurvedic description the good variety of lead is *Drutadrāvi, guru* (Heavy). On cutting it becomes black but bright. *Pūtigandhi* (with putrid smell), *snigdha, mrdu* (soft), *black* on the surface and bright from inside. Such lead is considered good and recommended for use.

Effect of unpurified & unreduced Nāga

In *'Āyurveda Prakāśa'* it is said that impure lead may produce *Prameha, Kṣaya* and *Kāmalā*. Hence it should be reduced after purification. It is said further that unreduced lead also produces the following diseases, if used internally, viz, diminishes the beauty of the body and produces- *Kuṣṭha, Kilāsa, Twak-vikāra, Sandhirujā, Pakṣavadha, Gulma, Prameha, Ānāha, Śoṣa, Bhagandara, Agnimāndya, Sūla, Śotha, Dāha, Asmarī, Mūtrakṛcchra, Apaci, Pāṇḍu, Kṣaya, Vidradhi, Jwara* and *Vāta Kaphaja rogas*. Hence it should not be used without proper purification and incinerations.

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Śodhana

सिन्दुवारजटाकौन्तीहरिद्राचूर्णकं क्षिपेत्। द्रुते नागेऽथ निर्गुण्ड्यास्त्रिवारं निक्षिपेद्रसे।।
नागः शुद्धो भवेदेवं मूर्च्छास्फोटादि नाचरेत्। र.र.स. ५/१७२-१७३

Drugs : Nirguṇḍī rasa, Nirgundī rasa with *Haridrā cūrna, Arkadugdha, Triphala Kaṣāya, Bhṛngā rāja rasa. Gomūtra, Goghṛta, Śītajala, Mākṣika* (Honey) and *Cūrṇodaka.*

Method : Melting & pouring it into the liquids *(Drāvaṇa* and *Niṣeka* or *Nikṣepa)* through a pot having a hole in the centre placed over the liquid pot. Process should be repeated 3 times or 7 times.

It is claimed in the texts that by this process the impurities like arsenic etc. obtained from mines along with mineral can be removed. According to *'Rasaratnasamuccaya'* the purified lead, when used, did not produce diseases; like *Mūrcha, Sopha,* etc.

Jāraṇa

Nāga has to be subjected to *jāraṇa*, an intermediatory process. The molten metal when rubbed hard with an iron spoon, adding herbal powder reduces to powder form. This process is known as *Jāraṇa*.

As mentioned above *Jāraṇa* of *Nāga* is an essential process before subjecting it to *Māraṇa* process. For this *Nāga* (purified) is put in a *Kaṭāhayantra* and heated to melting. Then add powder of the bark of *Aśwattha, Cincā* or other herbal drugs mentioned for the purpose from $^1/_4$th equal quantity. A small portion of the above powdered drug should be put in *Kaṭāha yantra* and it is then to be rubbed with *loha darvi* (spoon) till the whole lead is turned into a powder. It needs a long time as it is a slow process. In this process lead is divided into fine atoms and turns into an alloy after being mixed with the metallic portion of the herbs used for the purpose. On cooling, according to some scholars the whole powder should be washed with water to remove its alkaline portion found as residue of the burnt herbs.

Māraṇa

तत्तुल्यां च मनः शिलाम् कान्जिकेन द्वय पिष्ट्वा शिलया कान्जिकेन च।

(शा.सं. मध्यम खण्ड, अध्याय ११, ३८-३९)

Drugs : Minerals-*Pārada, Gandhaka, Manahśila, Tālaka,* Herbs *Cincātwak, Aśwattha twak.*

Bhāvanā : Vāsāswarasa, Tāmbūlarasa, Kāñjī.

Method 1 : Before subjecting it to *Puṭa, Jāraṇa* should be done by adding herbal drugs like *Cincā* or *Aswatthatwak.* Then it should be mixed with mineral drugs and triturated with an *Amladrava* or *Bhāvana drugs* and dried after making *Cakrika.*

Type & number of *Putas-Laghuputa first, Gajaputa* afterwards. 3-60 *putas* are needed.

Type of fuel-*Cow dung* cakes required for *Gajaputa.*

Apparatus-*Kaṭāha, Mṛtpātra, Sarāvasamputa.*

Bhasma colour- *Kapotacchaya.* (Grey colour), *Sindūrābha* (Red colour) *Pitābha Dhūsara* (Yellowish grey) or light blackish colour.

Method 2 : Add $^1/_2$th part of realgar to this powder and triturate it with *Vasārasa.* After drying put it in a *Sarāvasamputa* and subject it to $^1/_2$ *Gajaputa.* Such 40 *putas* result in making yellowish grey coloured lead *bhasma.* Some scholars add only sulphur in place of Realgar and use *Nimbūrasa* for *Bhāvanā* and give only 3 *Putas* to prepare lead *bhasma* of blackish colour. On the basis of the descrip-

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tion of colour of *Naga bhasma* it may be presumed that the compound prepared during *Marana process* is either sulphide or oxide of lead or a mixture of the two.

Pharmacological Properties

अत्युष्णं सीसकं स्निग्धं तिक्तं वातकफापहम्। प्रमेहतोयदोषघ्नं दीपनं चामवातनुत्।।

र.र.स. ५/१७१

Rasa : *Tikta, Katu, Lavana & Kṣāra.*

Guṇa : *Uṣṇa, Laghu, Snigdha, Sara, Guru*

Vīrya : *Uṣṇa*

Karma : *Balya, Daśa* or *śata nāgabalakara, Vīryavardhana, Āyuvardhana, Kāntivardhana, Kṛmighna, Cakṣuṣya, Vilekhana, Rajataranjaka.*

Effect on Doṣa : *Vātahara, Kaphavātaghna, Śleṣmaroga hara, Vātapittakaphahara*

Dose : 30-120 mg

Therapeutic Uses

Prameha, Dhanurvātā, vātaja roga, Kṛmijaroga, Swāsa, Grahaṇī, Atisāra, Arśa, Kuṣṭha, Gulma, Vraṇa, Śoṣa, Viṣa, Tṛṣṇā, Āmaśotha, Āmāśūla, Medoroga, Pāṇḍu, Āmavāta.

(Like *Vaṅga, Nāga* has also been extensively used in *prameha* group of disorders. It is said to be especially effective in all types of *pramehas*. In *prameha* it can be taken along with *haridra* and *āmalaki cūrṇa*. The vehicle is *Madhu*. In *Āyurveda Prakāśa* it is mentioned that *nāga* is a fire to the forest of *prameha*. In *Rasa Taraṅgiṇi* it is mentioned that *nāga* relieves from *prameha* just like lion kills an elephant).

Formulations

Vasantakusumakār Rasa, Trivaṇga bhasma, Nāgasindūra, Candreśwarā Rasa. Dīpīka Rasa, Nagendrā Rasa, Lakṣmivilaś Rasa, Ekangavira Rasa, Mahavatavidhwamsana Rasa etc.

VAṄGA

According to ancient view *Vaṅga* is said to have its origin from the *Indra* (king of *Devas*) i.e. the semen of *indra* is turned into *Vaṅga* (Tin). The term *Vaṅga* indicates the sources of this metal *Vaṅga deśa* Bengal. *Swarṇabhava, Nāgabhava, Nāgajivanaka* conveys its association with gold and lead ores. *Śwetarupya* denotes its appearance like silver white. *Mṛdu Vaṅga* and *Guruputraka* indicate its nature. From the oldest times till today it has been used in making alloys like *Bronze* by mixing it with *Copper* and zinc. It also forms alloys with *Antimony, Bismuth* and lead. It is principally employed for coating other metals, either to prevent rusting or to prevent the action of chemical reagents. It is also used in the manufacture of Tin plates. Tin Amalgam Gun metal, Type metal etc. Native tin is very rare. It is obtained only in a few places and that too in very small quantities. It is obtained from the stream of clearance river in greyish white granules along with platinum, gold, tin stone, and corundum. Generally it is obtained in mineral form. The only mineral of tin is cassiterite (SnO_2), tin oxide, which contains almost 80% tin. It is commonly brown or black, though occasionally red, grey or yellow, streak pale, luster-glassy to adamantine. Cassiterite forms crystals, but occurs more often as fibrous masses or as crusts or veins in granite and pigmatite rocks. It is distinguished from limonite by its high Sp. Gr. (7.0). Small amounts occur in placer deposits in *Alaska,* but most tin comes from

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Malaya and Bolivia. In India it is found in very small amounts mixed with other minerals. From its ore (concentrated) the tin is extracted by the simple process of reduction. The ore is heated with charcoal for reduction. By this process the oxygen of the ore is combined with carbon to form CO_2 and the melted metal is found at the bottom. Tin is a white shining crystalline metal which is malleable. Sheets may be made out of it. Open air does not affect its shining. It is harder than lead but may be cut with a knife. It is not so heavy as lead. At 200°C it becomes brittle. In cold air also it becomes brittle. It is not acted upon by atmosphere ordinarily. Vegetable acids also do not have any action on the metal. Pieces of pure metal sheets when pressed produce a sound which is due to breaking of its atoms and is distinguished by this sound from other metals. Sometimes small amounts of iron, lead, copper and arsenic are found mixed with it. Generally it is adulterated with lead for commercial reasons and in that case its colour is not so white and shining, rather it becomes *'slightly'* black. Probably this is a *misraka variety* of the ancients. *Nāga* and *Navasāra* when mixed with it lower its melting point.

Śānskṛt	:	Vaṅga
English	:	Tin
Hindi	:	Rānga
Chemical Formula	:	Sn
Latin	:	Stannum
Sp. Gr.	:	7.3
Melting point	:	232°C

Synonyms

Abhira, Cakra, Cipuṭa, Gurupatraka, Kaṣtira, Kuṭila, Kurūpya, Mṛduvaṅga, Mukhabhuṣaṇa, Nāgajīvana, Nāgabhava, Swarṇabhāva, Puṭigandha, Śwetarūpya, Paraśa, Pīccata, Puṭigandha, Raṅga, Raṅgaka, Śukra loha, Trapu, Trapuṣa, Vaṅga.

Varieties

1. *Sweta*	- good		*Rasārṇavam*
2. *Krṣna*	- Inferior		
1. *Khura Vanga*	- Superior		Other *Rasa* Texts
2. *Misra Vanga*	- Inferior		(*Rasendra Cūḍāmaṇi*) etc.

Khura vanga is pure. Hence it is considered to the the best while *Misra vanga* is mixed with many impurities and hence its colour is not so white. It is considered to be inferior and not recommended for use. In ancient times it was obtained from *Burma* mines and from there it was transported to *Bengal* and from there it is supplied throughout India. Hence it was known as *Banga* or *Vanga.*

Acceptable variety

According to ancient views the *Khuraka vanga* which is white like the moon or silver, *mṛdu* (soft), *snigdha,* (smooth), *laghu* (light), (*Rasārṇava),* or *guru* (heavy), *(Rasendra Cūḍāmaṇi),* *Nissabdam* (without sound), *sarala* (straight) *śudha* (pure) and *Drutadrāva* (low melting point) is regarded as the best. The other variety described as *Misraka* is considered inferior as it is found mixed with other impurities like lead etc. Hence its colour is described as *blackish white* and not recommended for use.

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Effects of unpurified & unreduced Vanga

According to *''Ayurveda prakāṣa, Aśuddha* and *Apakwa Vanga* may produce *Prameha, Gulma, Hṛdroga, Sūla, Arṣa, Swāsa, Kāsa,* and *Vamana.* According to *'Rasakāmadhenu'* it may produce *Dāha, Aśmari, Śotha, Meha, Kilāsa, Kuṣṭha, Świtra, Apacī, Kṣaya, Bhagandara, Śūla, Gulma, Pāṇḍu, Raktasrāva, Mūtrakṛcchra, Kapharoga, Vātaroga* and *Vidradhī.* Hence *Vanga* should be properly purified and reduced before it is used internally.

Śodhana

द्रावयित्वा निशायुक्ते क्षिप्तं निर्गुण्डिकारसे। विशुद्धयति त्रिवारेण खुरवंग संशय:।।

र.र.स. ५/१५६

Being one of the putilohas the *vanga* should be subjected to *śodhana*. The *nirvāpaṇa dravyas* prescribed by various authors are *āmla takra*, juice of *punārnava*, *ārka dugdha*, juice of *bṛṅgaraja, cūrnodaka*, *cīncha* twak *kaṣāya*, *gomūtra*, *kumāri swarasa*, *nirguṇḍi swarasa*, *mūtra* and *taila*. The process is repeated for 7 times. Some have mentioned repetition of the process for 21 times.

Jāraṇa

For this process *Vanga* is melted into a *Katāhayantra* by heating and then $^1/_4$th part of *Apāmārga* powder is added slowly to it and the whole is rubbed with *Lohadarvī* till the whole metal is converted into a fine powder. Through this process *Vanga* is divided into small atoms and mixes with the metallic residue of the herbs added to it, forming an alloy. Now the whole powder is collected at one place, covered with *Śaravāsaṁpuṭa* heated to red hot to allow all the carbon portion of the herbs to turn into ashes.

In another method $^1/_{16}$th part of mercury is added to tin and then *Tālaka* is also added and the mixture is rubbed with *Bhāradwāja (vanakārapas)* wood to make the metal into powder. This is considered to be a still better method for this purpose.

Māraṇa

पलाशद्रवयुक्तेन वंगपत्रं प्रलेपयेत्। तालेन पुटितं पश्चन्म्रियते नात्र संशय:।।

र.र.स. ५/१६१

स्वरसेन कुमार्यास्तु वर्या: क्षीरसरेण वा। विमर्द्य चकिका: कृत्वा ह्यर्वेभाख्ये पुटे पचेत्।।

एवं सप्तपुटेवंग्र मत भवति निशिचितम्। (रसामृत, अध्याय ३, ९४-९४ १/२)

Drugs - Minerals-purified mercury & orpiment. Herbal-*Apāmārga cūrṇa, Āraṇya kārpāsa, śuṣkapippaliwak-cūrṇa.*

Bhāvana drugs- Nimbu rasa, Kumāri rasa, Śatāvari rasa, Arkadugdha, Kṣirasara (santanika).

Method- Mix the *Jārita vanga powder* with mercury and *Haritālā* and triturate with *bhāvānā* liquids and allow it to dry after making *cakrikas.*

Type & number of Puṭa - Lāvaka puṭa, Ardha gajapuṭa and *Gajapuṭa 2-7 or 10 Puṭas.*

Type of fuel- Vanyapalas required for the above *puṭas.*

Apparatuses - Katāhayantra, mṛt-pātra, Sthūlāgraloha darvi. Sarāvasaṁpuṭa.

Bhasma colour -White as *Khaṭika, Samkha, Indu* or just like *lavaṇa* (salt).

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At the initial stage *gajapuṭa* fire is necessary and it should be reduced slowly to *ardha gajapuṭa* and *laghupuṭa* fire. After *Jāraṇa* some scholars suggest washing and some suggest that washing is not necessary as it does not make any difference in the final product. According to tradition *Haritāla* should be mixed only in the first *puṭa* and in subsequent *puṭas* it is not necessary to mix *tālaka* with it. It may be said further that for completion of *Māraṇa* process 7 *puṭas* are needed. The white colour of *vanga bhasma* is probably due to the presence to Tin oxide and some other substances in it.

(As a pretreatment, *Jāraṇakarma* is performed before proceeding to the general procedure of *māraṇa* especially of *puṭilohas*. The molten metal when rubbed hard with an iron spoon in open air, adding herbal powder/ minerals reduces to pwder form. This process is known as *jāraṇa*. This *jarita Vaṅga* is mixed with prescribed vegetable juices/ decoctions and triturated. This is made into cakes placed in *śarāvas* (earthen lids), covered, sealed and subjected to *puṭas* mentioned in texts. This process is to be repeated until it becomes white and fine powder. Drugs of vegetable origin useful in *Jāraṇa/māraṇa* process are *Apamarga, Arka, Aswata* and *Cīncā* Twak, Haridra, Palasa, etc. While durgs of animal origin which are helpful in the process are *kukkutāṇḍa twak, karkaṭāsthi* etc. *Rasa Hṛdaya Tantra* and *Rasarnava* have mentioned *tālaka yoga* in *māraṇa* process. Later the same was followed by *R. Chūdamaṇi, Rasa Prakas Sudhaka, Rasa Ratna Samūccaya and Āyurveda Prakaśa.* Regarding *puṭa* except *Āyurveda Prākaśa* and *Rasamriganka* all had prescribed *laghupuṭa*. The author of *Āyurveda Prākaśa* has mentioned *Gajapuṭa* while that of *Rasa-Mṛgānka* has mentioned *Ārdha gajapuṭa).*

Pharmacological Properties

Rasa	:	*Tikta, Āmla, Kaṭu, Kṣāra, Lavaṇa.*
Guṇa	:	*Rūkṣa, Śīta, Laghu, Sara, Uṣṇa.*
Vīrya	:	*Uṣṇa*
Karma	:	*Cakṣuṣya, Balya, Dīpana, Pācana, Rucikara, Medohara, Prajñākara, Dhātusthaulyakara, Varṇya, Saunadryakara* or *Vardhana, Āyuṣya Vṛṣya, Śaktidāyi, Puṣṭikara, Madanakara (Vājikara). Rasāyana, Dāhahara, Viṣahara, Saukhya kara, Vilekhana, Kṛmighna, Matiprada, Prabhākṛt, Bṛmhana, Ratirasavardhana.*
Effect on Doṣa	:	*Kaphapittahara, Iṣat-vāta prakopana.*

Dose : 125mg-250mg

Anupāna : *Gūḍuci Swaras, Madhu, Ghṛta, Haridraswarasa*

Therapeutic Uses

Prameha, Kṛmiroga, Pāṇḍu, Swāsa, Medoroga, Kaphajaroga, Viṣaroga, Aṣīti-Vātajaroġas, Dāha, Udara roga, Jaṭharavyāthi, Gulma, Grahaṇi, Vraṇa, Śoṣa, Śukrakṣaya, Kṣayaroga, Jarāroga, Mūtrakṛcchra, Ṣweta pradara, Vami, Agnimāndya, Ādhmāna.

Formulations

Induvaṭi, Unmādabhañjano Rasa, Kāñchanabhra Rasa (Bṛhad), Kumudeśwara Rasa, Kṣayakeśari Rasa, Tālakeśwara Rasa, Trinetrākhya Rasa, Nityānanda Rasa, Mahaśleṣamakālānal Rasa, Mahodadhi Rasa, Mehkeśari Rasa, Yogeśwara Rasa, Rasaśārdul Rasa, Lakṣmivilas Rasa, Vaṅgādi yoga, Vaṅgavaleha, Vaṅgaṣṭāka Rasa, Somanātha Rasa (Bṛhad), Swarṇavaṅga.

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Swarṇa Vaṅga

Method 1

रूद्रभागमितं वंगं दव्यां दत्वाऽनले न्यसेत्। विद्रुते तु तदर्ध हि सूत्रं तत्र विनिक्षिपेत्।।
शीघ्रं निक्षिप्य खल्वेऽथ निम्बूनीरेण पेषयेत्। दत्वाऽथ सैन्धवं किन्चिद बहुशः क्षलयेत्ततः।।
नरसारं गन्धकं च रसतुल्यं प्रदापयेत्। संपेष्य चातियत्नेने श्लक्ष्णचूर्ण तु कारयेत्।।
पाचयेत् सिकतायन्त्रे चतुर्याममतन्द्रितः। निर्धूमे जायमाने च काचूकूपी मुखे भिषक।।
संदशेन गृहीत्वा च कूपी भूमौ तु विन्यसेत्। कांचकूपीं विभिद्याथ कूपिकातलसंस्थितम्।।
स्वर्णवंगं स्वर्णवर्ण भिषग्यत्नात् समाहरेत्।। (रसामृत, अध्याय ३, ९५-१००)

Ingredients

1. Vaṅga	-	*2 Parts*
2. Pārada	-	*1 Part*
3. Nimbuswaras	-	*q.s.*
4. Navasādar	-	*1 Part*
5. Gandhak	-	*1 Part*
6. Saiṇḍhava	-	*q.s.*

Dose : 125-250 mg

Anupāna : *Madhu, Butter.*

Therapeutic Uses

Jīrnakāsa, Śwāsa, Prameha, Mūtramargaroga

Method 2

Take eleven parts of *Vaṅga* in an iron ladle and apply heat. On melting put half part of purified mercury and immediately pour the mixture in a *khalva* and grind well till it turns into fine powder form. Then add little quantity of *saindhava lavaṇa* and triturate it with *nimbu* (Citrus medica Var. acida) juice. Now wash it with water till blackness ceases to appear. On drying add *nsavasādara* and *gandhaka* equal to mercury, grind well till fine smooth powder is prepared. Fill it in a *Kācakūpī* and apply heat through *Vālukā yantra* for 4 *Yāmas* (12 hours) carefully. When fumes stop to come out of *Kācakūpi* remove *Vālukā yantra* along with *Kācakūpi* from the furnace and place it on the earth for self cooling. On colling take out the *Kācakūpi.* Clean it and break it from the middle and collect the golden coloured *Svarṇa vaṅga* carefully from the bottom of the bottle. It may be used in chronic cough, asthma and prameha (Urinary disorders).

It's dose is 1-2 *ratti* (125 mg to 250 mg) with honey.

Svarṇa Vaṅga is a very famous tin preparation prepared through *Kūpīpāka* method. The preparation of best quality *Svarṇa vaṅga* is very difficult. Hence with a view to standardise its method of preparation, research work has been done in the Department of *Rasa śāstra,* I.M.S., B.H.U. In this work, study has been made to establish the importance of its ingredients and their proportion. Though, chemically the finished product of *Svarṇa vaṅga* is tin sulphide and similar to mosaic gold in appearance, which means sulphur must be an essential ingredient for its preparation, then what about mercury and *navasādara* (NH_4Cl_2) used as its ingredients and their proportion, according to formula mentioned in different texts mercury is used either equal to tin or 1/2 to tin. Hence to assess the role of

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mercury in the preparation of *Svarṇa vaṅga,* mercury has been used in four proportion i.e. equal to tin, 1/2 to tin, 1/4th to tin and 1/6th to tin, as after tin, mercury is the only costly ingredient of this compound. Besides this, according to ancient *Rasa śāstra* concept metallic compounds prepared with mercury are considered to be of superior quality. Hence mercury was used in different proportions in this study. As regards *Navasādara* it may be said that it is also an important ingredient. Which helps to augment chemical reaction necessary to convert tin into tin sulphide.

It was also observed during this study that till *Navasādara* (NH_4Cl_2) was not used the best quality preparation could not be prepared. It is also important to mention here that market sample of *Navasādara* is almost a common salt and if that is mixed then also good quality *Svarṇa vaṅga* could not be prepared. It is only the chemically pure Ammonium Chloride which can augment chemical reaction necessary for *Svarṇa Vaṅga* formation. Some scholars also suggests the use of little quantity of KNO_3 (*Kalmīśora*) to brighten the colour and shining of the product. But as per our study it is not necessary. According to findings of our study mercury and *Navasādara* play an important role in the formation of this product, the use of mercury equal to tin gives best results. Half portion of mercury is also found equally good. But less than 1/2 part mercury could not produce good quality product. As in such cases (experiments) the final product contained bigger particles with lesser shining and brightness and thus makes the quality of finished product inferior. The higher proportion of mercury mixed with tin divides it into very fine particles and thus exposes its maximum surface area to react with sulphur and convert it into higher % of tin sulphide compound in the presence of Ammonium chloride. The findings of the chemical study also supports this view i.e. where the mercury proportion is higher the percentage of tin will be less. It is very much proportionate to mercury to tin i.e. lesser the mercury higher the percentage of tin in the compound.

Though, it is also a *Kūpīpakva rasāyana* preparation its heating schedule is slightly different and it is a bottom product of *kūpi.* However, here also initially the same heating schedule is followed i.e. starting with *mṛidu agni* and slowly raising the temperature to 300°C to 350°C. The fumes should be allowed to go out of the bottle. Care should also be taken to clear the blockage if any at the neck due to the collection of the fumes by inserting hot iron rod. But the hot iron rod should not go very deep and disturb the material at the base and thus allowing the chemical reaction to progress well at the base. When the fumes stops to come out and the material at the base is found converted into shining golden colour the heating should be stopped and allowed for self cooling. In this product the corking of the bottle is not required. The total duration of heating required is about seven to eight hours. On cooling the bottle is removed from the *Vāluka yantra* or furnace and broken from its middle. The shining golden yellow final product of *Svarṇa vaṅga* may be obtained from the base and *vaṅga sindūra* depends upon the proportion of mercury mixed with *vaṅga* in the beginning. If it is equal to *vaṅga,* the *sindūra* may be more. The well prepared *Svarṇa vaṅga* should have uniform colour and shining throughout the mass. It is a very light product having an alkaline taste.

As the *Svarṇa vaṅga* is indicated for all types of *pramehas* and as it is a tin compound, an experimental study has been conducted to see its role in the prevention of testicular degeneration and also regeneration of degenerated testicular tissues induced by $CdCl_2$ administration. The results of experimental study revealed that it possesses significant preventive and regenerative effects against $CdCl_2$ induced testicular degeneration.

Toxicity studies have also been conducted and showed mild toxic effects in the dose of 50 mg and 100 mg per 100 gram body weight in albino rats but did not show any toxic changes in 12.5 mg

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and 25 mg per 100 gm body weight dose i.e. four times to maximum therapeutic dose. Thus, the drug may be claimed quite safe in therapeutic doses and in higher doses also very mild type toxic changes observed in vital organs are found automatically reversible after the withdrawal of the drug in experimental animals.

Trivaṅga Bhasma

(सिद्धयोगसंग्रह स्वार्णादिधातु शोधनप्रकरण १५९)

Ingredients

1. *Jarita Trivaṅga* - 10kg
2. *Ghṛtakumāri swaras* - q.s.

Dose : 125mg

Anupāna : *Madhu,* Butter

Therapeutic Uses

Madhumeha, Prameha

YAŚADA

Knowledge of *Yaśad* to Indians by name of *Kharpara sattva* is since long back. It is placed in *Pūti Lauh* Group of metals. Use of *Yaśada* was not known till fourteenth century though its ore had been identified. *Yaśada* as a specific metal became known to Indian scholars from the 15th cent. A.D. *Madanapāla* was the first scholar to mention it along with other metals. Thereafter, scholars like *bhāvamiśra* and others mentioned it in their respective texts as the seventh *dhātu* (metal). But *pittala* (brass), an alloy of zinc was found mentioned since long i.e., from *vedic* times. Then what was the source of *pittala* in ancient times? The answer to this is the mention of *rasaka* much prior to that of *yaśad* (i.e. 15th cent. A.D.) : and *rasaka* was said to be *rītikṛt* and *tāmrarañjaka,* which means *rasaka* (the mineral of *yaśada* or zinc) was being used in its *sattva* form to make *pittala* (brass) in ancient times. To indicate this historical fact synonyms like *rītikṛt, tāmrarañjaka,* etc. were given for *rasaka. Madan Pal Nighaṇṭu* is the first book to mention *Yaśad* as seventh *Dhātu* with its Pharmacological properties. In Vangasena (12 A.D.) *Yaśad* was mentioned in the context of *Kharpar rakṣya rasāyan.* In *Rasrnava* (10th Century). It has been mentioned as *Kharpara Sattva* and it is like *Vanga Dhātu. Rasendra Bhaskara* author has described its myothological origin also as it is originated from *Daitya* body during *Devāsura-Mahayuddha.* Zinc is a metal which resembles tin in many respects and is used for making brass since ancient times. It is a white metal with bluish tinge. It is brittle at normal temperature, malleable and ductile at 180°C, and becomes brittle again at 200°C when it could be made into powder. It is highly acted upon by acids and alkalies. It is now extensively used for coating iron vessels to protect them from rusting. Its minerals are obtained from veins, replacement deposits, igneous and carboniferous rocks and are associated generally with lead and copper. Zinc is not found in native form but is obtained almost from minerals. In nature, it is usually found in the form of sulphides, oxides, carbonates and silicates. Sphelerite (ZnS) is its sulphide minerals. It is yellowish, brick red, grey or blackish in colour and resinous in lustre. Its hardness is 3.5 to 4, sp. gr. is 4 and it is easily breakable. Prof. Kulkarni suggests that *guḍāābha rasaka* is similar to this. Zincite (ZnO) is its oxide mineral. It looks like soil having yellowish red colour. It may be taken as *mṛttikā rasaka.* Smithsonite ($ZnCO_3$) is its carbonate mineral. It is mixed with crystaline crust and is hard and hence may be taken as *pāṣāṇābha rasaka.* Hemimorphite ($ZnSiO_2$) is its silicate mineral. It is also crystalline and

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hard and hence may be taken as *pāṣānābha rasaka.* The *sadala* and *nirdala* varieties of *rasaka* mentioned in ancient texts may be taken as carbonates and silicates, respectively.

Śānskṛt	:	Yaśada
English	:	Zinc
Hindi	:	Jasta
Latin	:	Ziṇcum
Chemical Formula	:	Zn
Sp. Gr.	:	7.1
Melting Point	:	429°C
Boiling point	:	980°C

Synonyms

Kharparaj, Tāmrañjak, Yaśada, Kharprasatwa, Netrarogāri, Ritihetu.

Availability

In India it is found in Rajasthan , Bihar, M.P. etc. The major producers of zinc are Canada, Russia, Australia, Peru, U.S.A., Mexico, China, Japan, Poland, Spain and Sweden.

Varieties

Rasaka is described to be of three or two types. These are *Mṛttikā rasaka, Guḍābha rasaka and Pāṣāṇābha rasaka*. Some texts also described its *dardura* and *kāravellaka* varieties which are *sadala* and *nirdala,* respectively.

Acceptable Variety

The Zinc which is bright and shining on cutting, clear, soft, heavy and quick melting is considered to be of superior quality.

Inferior Variety - The Zinc which is hard, rough, light dull coloured, melts with difficulty is considered inferior and should be discarded.

Need of Śodhana

Unpurified and unincinerated zinc is likely to produce diseases like *prameha, ajīrṇa, vātavyādhi, gulma, kṣaya, kuṣṭha, vamana* and *bhrama* on internal use.

Śodhana

Drugs - Godugdha, cūrṇodaka, nirguṇḍī drava, snuhī kṣīra.

Method - Melting and pouring into the above mentioned liquids seven to twentyone times.

Māraṇa

Drugs - Purified *Pārada,* orpiment, sulphur, *bhaṅgā, postā, apāmārga, nimba kāṣṭha.*

Bhāvanā - Kumārī svarasa

Method : The metal is first converted to fine powder form by *jāraṇa* method, that is by heating it in an open iron pan (*kaṭāha)* with the powder of prescribed herbal drugs and rubbing till the metal is completely reduced to powder form. It is then triturated with the *bhāvanā* liquid and subjected to heating by *puṭa* system.

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Number of Puṭas : Seven to ten *gajapuṭas.*

Colour of bhasma : Slightly yellowish or greyish. Light yellowish colour of the *bhasma* is due to the formation of zinc oxide formed as a result of heating in presence of oxygen. If any untoward effects are produced by the use of *yaśada bhasma, balā* and *abhayā* powder may be taken along with sugar for three days to get rid of these effects.

Pharmacological Properties

Rasa - *Tikta, Kaṣāya, Kaṭu*

Guṇa - *Śīta.*

Karma - *Parama cakṣuṣya, bala vīrya buddhi vardhana, śleṣma kalā samkocakara,*

Effect on doṣa - *Kapha Pittahṛt*

Anupāna : *Madhu, Guḍūciswaras, Trikaṭukaṣāya*

Dose : 60 – 120 mg

Therapeutic Uses

Kāsa, Śwāsa, Ekānga-Sarvāng vāta, Niśāśweda, Pāṇḍu, Grahaṇi, rājayakṣama, prameha, śwetapradara, Jvara, netra roga, Vraṇa srāva, Kampavāta, rajaḥsrāva.

Formulations

Trivaṅga Bhasma, Śilajatvādi Vati, Laghu vasant mālati rasa, Pramehantaka lauha, Yaśadāmṛt, Yaśadāmṛt malahar etc.

KĀṀSYA

Bronze is an alloy made primarily of Copper and Tin, approximately in 8:2 proportions. The copper and tin are first melted and then mixed in a proportion desired and after cooling, bronze is formed. In ancient times *Kāṁsya* made in *Saurāṣṭra* was considered the best. Now a days bronze is made by mixing seventy eight parts of copper with twenty two parts of tin. Bronze is very hard, strong and blackish-red in colour. It may contain as much as 25% tin. Phospharus, lead zinc and other metals may be added for special purposes. For example, phosphorus hardens and strengthens bronze. Bronze is unaffected by dry or moist air. Most bronze alloys resist corrosion, hence the statues made of bronze last hundreds of years. Because it is easily cast in large shapes, bronze is often used in making bells and cymbals. It also has special sound-damping characteristics that give these bells a rich tone. Bronze is malleable and thus can be drawn into sheets. It is little affected by acids.

Śānskṛt	:	*Kāṁsya*
English	:	Bronze, Bell metal, white copper, white metal
Hindi	:	*Kāṁsa*
Latin	:	Branz
Chemical Contents	:	8 Parts copper + 2 Parts tin

Synonyms

Kaṁsak, Kāṁsīya, Kāṁsyaka, Ghoṣaka, Ghoṣa, Ghoṣapuṣpa, Vahniloha, Tāmratrapuja, Dīptaka, Dīptaloha, Saurāṣṭraja, Saurāṣṭrik.

Varieties

Two varieties of *Kāṁsya* (bronze) have been mentioned in *Āyurvedic* texts, *Puṣpaka* and *Tailika Kāṁsya.*

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Puṣpaka Kāṁsya : It is more whitish in colour than the other. It contains more percentage of tin. It creates high-pitched notes of sound, when struck.

Tailika Kāṁsya : This variety is blackish-yellow in colour and contains less percentage of tin.

Acceptable Variety

Puṣpaka Kāṁsya is used for medicinal purpose. It is soft and smooth.

Śodhana

तप्तं कांस्यं गवां मूत्रे वापितं परिशुद्धयति। र.र.स. ५/२०९

The leaves of *Kāṁsya* are heated in intensive fire and dipped in cow's urine to purify.

Māraṇa

म्रियते गन्धतालाभ्यां निरूत्थं पंचभिः पुटैः ।। त्रिक्षारं पंचलवणं सत्पधाऽम्लेन भावयेत् ।
कांस्याऽऽरकूटपत्राणि तेन कल्केन लेपयेत् ।। रुध्वा गजपुटे पक्वं शुद्धं भस्मत्वमाप्नुयात् ।।

र.र.स ५/२१०-२११

Gandhaka and *Haratāla* are rubbed in lemon juice and the resultant paste is applied over the leaves of *Kamsya*. Then they are heated in the *Śarāva Sampuṭa* and given 5 *puṭas* to obtain the *Nirttha bhasma* of *Kāṁsya*. Or the paste prepared by rubbing *Kṣāratraya* (*Swarjika Kṣāra, Yava Kṣāra* and *Tankaṇa Kṣāra*) and *Pañcalavaṇa* (*Saindhavalavaṇa, Kṛṣṇa, Sambara, Samudra* and *Udbhida lavaṇa*) in the sour liquid for 7 times and is pasted over the leaves of *Kāṁsya,* kept in *Śarāva Sampuṭa* and given *Gajapuṭa* which yields very good *bhasma*.

Pharmacological Properties

कांस्यं लघु च तिक्तोष्णं लेखनं दृक्प्रसादनम्। कृमिकुष्ठहरं वातपित्तघ्नं दीपनं हितम्।।
घृतमेकं विना चान्यत्सर्वे कांस्यगतं नृणाम्। भुक्तामारोग्यसुखदं हितं सात्म्यकरं तथा।।

र.र.स. ५/२०८-२०९

Rasa	: *Tikta, Kaṣāya*
Guṇa	: *Uṣṇa, laghu, viśada, sara, rūkṣa.*
Vīrya	: *Uṣṇa*
Karma	: *Dīpana, lekhana, vṛṣya, dṛkprasādana, dṛda dehadāyī, svarya, cakṣuṣya, ārogyakara, svāsthyakara.*
Effect on Doṣa	: *Kaphavātajit, vātahara, vātapittaghna, kaphapittaghna.*

Therapeutic Uses

Arśa, netra roga, prameha, kṛmi, kuṣṭha. Kāṁsya bhasma is used in treating various skin diseases and worms. It improves the appetite and is beneficial to the eyes *(netrya)*.

Like *Pittala kāṁsya* also possesses the properties of the metals of which it is made of. According to *Rasa Prakāśa Sudhākara mṛta kāṁsya* is claimed to be good as *vātahara* and *prameha nāśana*. It is also said about *kāṁsya* that all substances or materials, other than ghee, kept in or eaten from *kāṁsya* vessels prove to be *ārogyakara, sukhakara, hitatama* and *sātmyatama* for the body. *Rasa Prakāśa Sudhākara* adds *āmla* and *śāka* also to ghee in this context.

Dose : 60 to 120 mg, with honey.

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Formulations

Kāṁsyapiṣṭi Rasa, Kṣayakesari Rasa, Gulmavajraṇi Vaṭi, Cakrākhya Rasa, Cintamaṇi Rasa, Nityānand Rasa, Pittalarasāyan, Pūrṇacandra Rasa, Makaradhwaja Vaṭi, Muktādya Cūrṇa, Meghanād Rasa, Rasāñjanādi Vaṭi, Lakṣmivilāsa Rasa, Vātavidhvamsan Rasa, Śambhukāñjan, Ṣaḍānan Rasa.

PITTALA

Brass is an alloy made primarily of Copper and Zinc, other elements may be added to the alloy for special uses. The proportion of copper to zinc is normally 2:1 in brass. *Āyurvedic* texts mention to take pure copper and pure zinc together and to subject them for intense heating in a *garamūṣa* (crucible, prepared of roasted old clay 6 parts and *maṇḍūra*, black soil, coal and Bengal hemp, mixture). The intense heat melts both the metals and form homogenous alloy, which gets solidified after pouring in liquids. Commonly brass is a yellow coloured, shiny alloy. Its cut surface is more shining. It becomes harder than individual copper and zinc. The brass is hard and possesses ductility and malleability. It is unaffected by dry weather, but moisture causes the loss of its yellowishness and shine and it turns blackish. Brass is unaffected by pure water. The substances of acidic nature act with the copper contents of the brass and turn it into greenish colour because of salts formed. The allows are resistant to atmospheric and marine corrosion.

Śānskṛt	:	Pittala
English Name	:	Brass
Hindi	:	Pītal
Chemical Contents	:	2 Parts Copper + 1 Part of Zinc

Synonyms

Pittalasa, pitaloha, Rītikā, Āra, Arakūṭa, Kapiloha, Kṣudra suvarṇa, Pingala, Pittala, Pītaka, rīti, Sitakanaka

Śodhana

Rīti becomes *śuddha* (purified) by heating and dipping/quenching five times in *nirguṇḍī svarasa* containing *haridrā* powder.

Māraṇa

Grind *manaḥśilā* and *gandhaka* in *nimbū rasa,* apply *ritī* with that paste and subject to heating by *puṭa*. By repeating the process eight times *rītī* is converted to ashes. It can be used for desired purposes. It can also be converted to ashes by the method mentioned for copper and may be used wherever required.

Pharmacological Properties

रीतिस्तिक्तरसा रूक्षा जन्तुघ्नी सास्त्रपित्तनुत् । कृमिकुष्ठहरायोगात्सोष्णवीर्या च शीतला ।।
काकतुण्डी गतस्नेहा तिक्तोष्णा कफपित्तनुत् । यकृत्प्लीहहरा शीतवीर्या च परिकीर्तिता ।। र.र.स. ५/१९५-१९६

The *Rītika* type of *Pittala* is *tikta* in *rasa, rūkṣa* and beautiful. It cures *Rakta Pitta, Kṛmi* and *kuṣṭha.* It is *yogavāhi* in nature and acts as a *uṣṇa vīrya* drug along with the other *uṣṇa vīrya dravya* and *śīta vīrya drug*, when combined with other *śīta vīrya drug*.

The *Kākatuṇḍi* variety of *Pittala* is *Asnigdha,* (non slimmy), has *tikta rasa, uṣṇa* to touch and alleviates *kapha* and *pitta.* It eradicates the diseases of *Yakṛt* and *Plīha* and is *śīta* in *vīrya*.

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Acceptable Variety

Heaviness, softness, yellowness, strong, resistibility to hammering (malleable) and brilliancy are the properties of superior *rītī*.

Current method of Making Brass

The first step in making brass is to melt copper in an electric furnace. Solid pieces of zinc are then added to the melted copper. The zinc melts rapidly. A covering of charcoal is often placed over the liquid metals to reduce the loss of heat and to prevent an excessive loss of zinc by vaporization. After the copper and zinc have been melted and thoroughly mixed, the brass is ready for pouring. It can be poured directly into forms to cast the wanted articles, or it can be made into bars called billets. Such bars make it easier to work with the brass or to store it. Workers may cut off the top of the brass bar. This portion, which became solid last, contains impurities and is porous. The billet is then placed in another furnace and reheated until it reaches the proper temperature for working.

The colour and properties of brass vary with its composition.

Formulations

Pittalarasāyana, Meghanāda rasa, Ratnaprabha vaṭi, Kṣaḍanan ras, Ekādaśayas ras, Swarṇasindūra Ras.

VARTALOHA OR PAÑCALOHA

Varta loha is a mixture or alloy of the following five metals *Kāmsya, Tāmra, Pittala, Loha* and *Nāga.* They are mixed in equal proportion and method to make the bell metal. In *Lohaśāstra, Varta Loha* is known as *Pañca loha* and *Viḍaloha.* It is also included in *Miśraloha* or *Upaloha* in *Rasa texts.* According to the statement of Shri. Kulkarni some scholars take it as *German silver.* But in his view it is not correct as the composition of German Silver is as follows–Copper 60 parts, Zinc 20 parts and Nickel 20 parts when mixed together German Silver is made. Thus it contains only three metals while *Vartaloha* consists of five metals. According to the statement of *Rasa Ratna Samucchaya* all the food materials except acidic materials when cooked in this vessel become *Dīpaṇa, Pācana* and *Hitakara.* While in *Āyurveda Prakaśa Dāl* (pulses) and other food articles could be cooked in this vessel without any loss in their property.

Śānskṛt	:	Vartaloha or Pañcaloha
English	:	Bell metal
Hindi	:	Pītal

Śodhana

Like *Pittala* and *Kāmsya, Vartaloha* should also be purified first by the *Sāmānya śodhana* method i.e. by *Taila, Takradi* method and then for *Viśeṣa śodhana* it should be dipped either in *'Ajā Mūtrā'* or *Aśwa Mūtra* for 7 times.

Māraṇa

Ingredients : Gandhaka, Tālaka

Bhāvanā drugs : Arkakṣīra

Method : Prepare a paste of *Gandhaka* and *Tālaka* with *Arka Kṣīra.* This is to be pasted over *Vartaloha* which after sealing in *Śarāva Sampuṭa* is subjected to *Puṭapāka.*

Type and number of *puṭas*-five *Gajapuṭas.*

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Fuel : Vanyopalas

The *bhasma* prepared by the above-mentioned method becomes *Yogavāhī* and could be used in different preparations whenever required.

Pharmacological properties

Rasa	:	*Āmla, Kaṭu*
Guṇa	:	*Hima, Rūkṣa*
Vīrya	:	*Śīta*
Karma	:	*Rucya, Twacya, Kṛmighna, Netrya, Dīpana, Pācana, Malaviśodhana.*
Effect on Doṣa	:	*Kaphapittanāśana*

Therapeutic Uses

Netreroga, Galaroga, Sarvaroga.

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Chapter 10

RATNA

Ratnas are those, which are considered the best with regards to qualities and properties in their respective groups. Some scholars mentioned that some substances are known as *ratnas* because of their high cost, shining and bright appearance and a few other superior qualities, and on account of these superior characteristics and qualities these are liked by rich persons. Generally *ratnas* are stone materials but a few animal products are also included in this group because of their high cost and superior characteristics and qualities. In modern literature these are called gems or precious stones. In ancient literature *Ratnas*, on the basis of their characteristics, are divided into two groups, viz.

(1) *Ratnas* (precious stones) and (2) *Uparatnas* (semiprecious stones).

In this chapter nine *Ratnas* have been described in detail and in the end some drugs of the *uparatna* group have also been described, though these are not found mentioned in the original text. The relationship of the nine *ratnas* with the nine planets is also mentioned in *Rasa Ratna Samuccaya*. The nine *ratnas* (gems) they're Hindi and English names and their relationship with the nine planets (grahas).

Name of the Gem	*Hindi name*	*English name*	*Name of the Planet*
Māṇikya	*Māṇika*	*Ruby*	*Sūrya-Sun*
Muktā	*Moti*	*Pearl*	*Candra-Moon*
Vidrum	*Muṅgā*	*Coral*	*Maṅgala-Mars*
Tārkṣya	*Pannā*	*Emerald*	*Budha-Mercury*
Puṣparāga	*Pukharāja*	*Topaz*	*Guru-Jupiter*
Bhidura	*Hīrā*	*Diamond*	*Śukra-Venus*
Nilam	*Nīlā*	*Sapphire*	*Śani-Saturn*
Gomedaka	*Gomeda*	*Hessonite*	*Rāhu-Dragon's head*
Vaiḍūraka	*Vaiḍūrya*	*Cat's eye*	*Ketu-Dragon's tail*

Qualities of best ratnas (gems)

The best quality gem should be clear, light, shining or glittering and must possess various surfaces and angles. According to modern view gems should be beautiful, durable, rare, costly and portable. The beauty of a gem depends upon its transparency, clarity, brilliancy, colour, lustre and shining appearance. These qualities could best be seen when the gems are cut and polished.

Defects of ratnas

In ancient texts five defects of gems are described. These are *grāsa, trāsa, bindu, rekhā,* and *jalagarbhatā*. According to modern terminology these may be explained as : *grāsa* means black spots, *trāsa* means discolouration or presence of grains, *bindu* means erosions, *rekhā* means lines or boundaries, and *jalagarbhatā* means presence of bubbles. Gems are claimed to be free from earth and water born defects.

Origin of ratnas

It is claimed in ancient texts that *ratnas* got originated from the shining eyes of angry *Mahākāla* engaged in the drying of sea of at the end of *pralaya*.

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It is also mentioned that mountains, rocks, the sea and animals are important sources of the *ratnas.*

MĀṆIKYA

Māṇīkya is the most favourite gem of the planet Sun *(Sūrya graha)* and hence should be worn on the body or used internally to please the planet sun and vanish its *Prakopa* (ill effects). Ruby and sapphire can be produced artificially. The synthetic corundums are very shining and bright and when small in size extremely difficult to distinguish from natural stones. Ruby is used astrologically to propitiate the sun. The physical characteristics of ruby useful for astrological purpose are described in astrological and *Āyurvedic* works. For purposes of medicine, raw, unpolished ruby can also be used. Chemically ruby is aluminium oxide but also contains iron, chromium and titanium oxides in traces. Its colour is deep red due to the presence of iron and chromium in small amounts. Its crystals are hexagonal and its lustre is vitreous. Ruby occurs in Burma, Sri Lanka and India, and specially in Mysore and Orissa. The ruby obtained from Burma is considered to be the best.

Śānskṛt	:	*Māṇikya*
English Name	:	Ruby
Hindi	:	*Māṇikya*
Chemical Formula	:	Al_2O_3
Specific Gravity	:	4
Hardness	:	9

Synonyms

Māṇkya, Padmarāga, Vasuratna, Suratnaka, Ravi Ratna, Sona Ratna, Kuruvinda and Lohita.

Varieties

माणिक्यं पद्मरागाख्यं द्वितीयं नीलगन्धि च । र.र.सु. ४/८

कुशेशयदलच्छायं स्वच्छं स्निग्धं गुरु स्फुटम् । वृत्तायत्तं समं गात्रं माणिक्यं श्रेष्ठमुच्यते ।। र.र.स. ४/९

According to *Rasa* texts :
1. *Padmarāga* - Red,
2. *Nīlagandhi* - Bluish red.

According to Sanskrit texts :
1. *Kuruvinda,*
2. *Saugandhika.*

According to colour :
1. Red,
2. Yellowish,
3. Greenish (*aśokapatrachāyā*),
4. Reddish yellow (*tumburucchāya*).

Acceptable variety

Ruby of superior variety should be deep red just like *guñjā* (dried berry of *Abrus precatorius*) or *indragopa* (cochineal), should have shine like lotus, shuold be transparent, oval, smooth, clear, uneven and big in size. Besides these, it should emanate red rays on coming in contact with the morning sun, put in milk will make the milk look red and on rubbing over the *nikaṣa* (touch stone) would shine much and look beautiful.

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Inferior variety : The ruby having holes, rough and flat surface, dull appearance, light weight, uneven and small in size is inferior.

According to *Yukti Kalpataru, māṇikya* is supposed to contain the following defects, viz., *vicchāya, virūpa, aśobhana, dhūmravat paśubandhu vināśakṛt, parābhavakara, śaśtrāghātakara* and *sambhedan (Jathara doṣakṛt)*. Ruby and sapphire can be produced artificially. The synthetic corundums are very shining and bright and when small in size extremely difficult to distinguish from natural stones.

Śodhana

निम्बूकस्वरसेनेह दोलायन्त्रे विधानतः । यामैकं स्वेदितं कामं माणिक्यं शुद्धिमाप्रुयात् ।। र.तं. २३/४६

Māṇikya should be purified in *ḍolā yantra* by adding lemon juice for three hours it should then be washed with warm water and dried.

Māraṇa

Māṇikya is used both in *bhasma* and *piṣṭi* forms. *Māṇikya* should be added with equal quantity of each of purified realgar, purified orpinment and purified sulphur. In an iron pestle and mortar it should be triturated by adding lemon juice. The process of trituration should be continued for seven days. Before trituration, pieces of ruby should be made into powder by pounding in an iron container. After trituration, small cakes should be made into powder by punding in an iron container. after trituration, small cakes should be make out of it, dried in sun, kept is *Śarāva Saṁpuṭa* and cooked in *Gaja Puṭa*. This process should be repeated for eight times. For the purpose of *Piṣṭi*, raw powder or purified ruby should be triturated in an iron pestle and mortar by adding rose watger. The trituration should be continued till ruby is reduced to a very fine powder from. It should then be strained through a fine cloth and stored in a glass bottle.

Pharmacological Properties

Rasa	-	*Madhura*
Guṇa	-	*Snigdha, śīta, rūkṣa.*
Karma	-	*Sandīpana, vṛṣyatama, balya, rasāyana, medhya, hṛdya, āyuṣya, vājikara.*
Effect on Doṣa	-	*Kapha vātahara, vātapittanut, tridoṣanāśana.*

Therapeutic Uses

Karmaja roga, bhūtavaitālādijanyaroga, sūryagrahajanya roga (śiropīḍa, prameha, satata jwara, santata jwara and *pitta roga), kṣayaroga, āmaśūla, hṛdroga, viṣūcikā, dāha jwara, hikkā, śirovraṇa, viṣaja roga.* It is very effective in the treatment of ay type of bleeding in the body. It cures impotency and tuberculosis.

Anupāna : Muṣk or Honey.

Dose : 100 to 200 mg twice daily in empty stomach.

TĀRKṢYA

Tārkṣya is the most favourite gem of the planet *Budha* and hence should be worn on the body or used internally to please the planet *Budha* and vanish its *prokopa* (ill effects). Astrologically it is used externally to propitiate the planet mercury. Chemically *tārkṣya* is berylium aluminium silicon oxide but it also contains chromium in traces which imparts a green colour to it. *Tārkṣya* has a shining deep

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green colour and its value is in proportion to its greenness, transparency and brightness. It is an intimate mixture of corundum, magnesite, hematite, quartz and spinel and may vary from dark grey to black. Initially it was considered to be an iron ore. *Tārkṣya* occurs in Columbia, Russia, China, Central Asia, Egypt and India. In India it is obtained from Kashmir, Punjab, Rajasthan, Madhya Pradesh, Bihar, Mysore and Coimbatore in small quantities.

Śānskṛt	:	*Tārkṣya*
English Name	:	Emerald
Hindi	:	*Pannā*
Chemical Formula	:	BeO_3, Al_2O_3, $6SiO_2$
Hardness	:	7 to 9

Synonyms

Tārkṣya, Gārutmata, Garuḍodgāra, Dṛṣadgarbha, haritamaṇi, Marakata, Garuda, Budha Ratna, Rouhineya and Harid Ratna.

Varieties

Varieties of *tārkṣya* are not mentioned in Āyurvedic *rasa* texts. However, in modern literature its three varieties based on colour are mentioned.

1. Green - Good
2. Bluish - Medium
3. Whitish - Ordinary

Acceptable variety

Tārkṣya of superior variety should be green like grass, leaf of banana or bamboo, should shine like sun rays, should be smooth, brilliant, heavy, big and without holes and bubbles. Further, it should resemble peacock's neck in colour and appearance.

Inferior variety–*Tārkṣya* which is black, reddish black, blue and white, rough, flat, uneven, light small, contains holes and bubbles is inferior.

Śodhana

Emarld should be made *śwedana* in a *ḍolā yantra* prescribed for ruby are to be followed for emerald also.

Pharmacological Properties

Rasa	-	*Madhura.*
Guṇa	-	*Śīta snigdha.*
Vīrya	-	*Śīta.*
Karma	-	*Ojovardhana, balya, vṛṣya, puṣṭikara, agnidīpana, pācana, rucikara, viṣaghna, bhūtabādhāra.*
Effect on Doṣa	-	*Sannipātanut.*

Dose : 100 to 200 gms twice daily in empty stomach.

Anupāna : Honey

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Therapeutic Uses

Agnimāndhya, āmlapitta, chardi, arśa, śūla, jvara, śopha, pāṇḍu, śvāsa, sannipāta, viṣa and *Buthagrahajanya roga (tvakroga, vātajapīḍā, vicarcikā, unmāda, jihvaroga, vamana, kaphaja* and *tridoṣaja vyādhis).* Emerald *bhasma* is useful in the treatment of chronic fever, vomiting, *asthma,* piles, anemia and oedema.

VAJRA

Diamond is said to have originated from the fallen drops of *Amṛta* (nectar), being drunk by the *Gods* and demons. Also said to have originated from the body of the demon *Bali.* It is one of the importance jewels, and therefore well known. Astrologically, it is used in a ring or necklace to propitiate the planet Venus. For that purpose, the physical characteristics of diamond, viz., it size, shape and transparency are described in *Āyurvedic* and astrological texts in detail. For the purpose of medicine, these specifications arę not essential and even raw and unpolished diamond can be used. It should however, be natural diamond. Synthetic diamonds are not useful for medicinal purposes. It is the hardest substance. Therefore, preparing *bhasma* out of it involves some special technique. *Vajra* (diamond) contains carbon only and belongs to coal group. Hence when heated in open air in the presence of oxygen at high temperature CO_2 is produced from it. The difference between diamond and coal lies in their structure, *i.e.,* in diamond the carbon atoms are situated densely hence it is very hard. Diamond has no specific colour or is usually colourless but sometimes it is slightly yellowish, yellow, red, green, blue and rarely black. Its crystals are cubic, hexaoctohedral, often rounded or distorted. The crystals are transparent to translucent and opaque. The colourless diamonds are pure carbon but coloured stones may contain, calcium, sodium, copper, silicon, aluminium, boron, iron and mangnesium in traces. Diamond is unaffected by acids, is an excellent conductor of heat but poor conductor of electricity. Till 17th A.D. diamond was not found in any other country except India. But now-a-days diamonds are found abundantly in Brazil, Australia, South Africa and India. Indian mines are situated in Vijayanagaram, Golkonda, Madras and Bundelkhanda. India and Borneo were the earliest sources of diamond.

Śānskṛt	:	*Vajra, Kuliśa, Hīraka, Bhidura*
English Name	:	Diamond
Hindi	:	*Hīrā*
Specific Gravity	:	3.5
Hardness	:	10

Synonyms

Vajra, Hirā, Abhedya, Bhidūra, Kuliśa, Vajraka and *Hargava Priya.*

Complications of Aśuddha Vajra

It used withot proper purification and *Māraṇa* diamond may cause excruciating pain in the sides of the chest, *Kuṣṭa* (obtainate skin diseases including leprosy), burning sensation all voer the body and giddiness.

Śodhana

Drugs	-	*Kulattha or kodrava kvātha, hayamūtra, taṇḍulīya dravą, vajrakṣīra, vyāghrī kanda, pārada.*
Process	-	1) *Niṣecana* after strong heating for one hundred times at least.

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2) *Svedana* in *dolāyantra* from one *yāma* to seven days.

3) *Puṭapāka* for twenty four hours.

4) Dipping into mercury after heating.

Pieces of diamond should be taken with foreceps, heated over the flame of fire and immersed in the latex of *Snuhi* (Euphorbia nerifolia linn.) This process should be repeated for one hundred times. Similarly, heated pieces of diamond shouldbe immerse in the decoction of *Kulattha* for 100 times. For this purpose, it is to be heated over a strong flame of fire so that it becomes red hot like a piece of ignited charcoal. Thereafer, it should be immersed in the patex and decoction described above. Since it may not be convenient to hold the piece of diamond for such a long time with forceps, in practice, it is generally kept in a crucible (*mūṣa*) which is heated over strong fire, and from out of this crucible, the red hot diamond should be immersed into the latex and the decoction. This prcess serves two purposes. It makes diamond free from any toxicity and it also makes the piece of diamond very fragile so that its *Māraṇa* (reducing into a fine powder from) becomes easy. After purification, diamond should be kept in a pestle and mortar and triturated. It should then be strain through a fine cloth and kept tin a glass bottle.

Māraṇa

Drugs	-	Purified *manaḥśilā, haritāla, gandhaka, rasasindura, svarṇamākṣika bhasma.*
Bhāvanā drugs	-	*Kulattha kvātha,* three years old *kārpāsamula svarasa.*
Puṭapāka	-	Heating fourteen times by *puṭa* system through *mahāpuṭa* or *gajapuṭa.*

There are a number of *māraṇa* methods for *vajramarāṇa* but the above mentioned method is simple, easy and common. It is a slight modification of the method mentioned by Soma *Senāni* in *Rasa Ratna Samuccaya.* The conversion of diamond into ash is really a difficult task. Diamond is the most favourite gem of the planet *(graha) Śukra* and hence may be worn on the body or may be used internally in *bhasma* form to please the planet *Śukra* or to remove its *prakopa* (ill effects).

Purified fine powder of diamond should be added with equal quantity of each of *rasa sindūra,* purified realgar, purified orpiment and purified sulphur and kept in an iron pestle and mortar. To this, the decoction of *Kulattha* (Dolichos biflorus Linn.) should be added and triturated for three days. The paste of this shold be made to a cake form, dried in sun, kept in *śarāva saṁpuṭa* and cooked into *gaja puṭa*. This process should be repeated for 14 times.

Pharmacological Properties

Rasa	-	*Ṣaḍrasa*
Guṇa	-	*Snigdha, śīta*
Karma	-	*Āyuprada, parama, hṛdya, yogavāhī, pradīpana, vṛṣyatama, vayastambhakara, kāntijanana, saukhyajanana, rasāyana, sudhāsama, balaprada, netrya, medhya, rogaghna, mṛtyuhara sarva siddhiprada, dravyakarī, rasabandhakara, rasamāraka.*

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Effect on Doṣa - *Tridoṣa Śamana*

Anupāna : *Honey*, Milk, Cream, Sugar or musk.

Dose : 3 to 6 mg twice daily in empty stomach. Since it is used in a very small quantity, it is generally mixed with other medicines like *rasa sindūra* (about 30 times) and then administered to the patient. Depending upon the nature of the diseases, other suitable drugs can also be added to the *bhasma* of diamond and administered to the patient a compound form.

Therapeutic Uses

Sakala roga, balipālita, rājayakṣmā, prameha, medoroga, pāṇḍu, śotha, udararoga, klaivya and *mṛtyu.*

Nara Vajra : Sarvadoṣāpaha, vedhaka, rasabandhakara, loha krāmaṇaśīla, satvayukta, good for all.

Nārī Vajra : Deha siddhiprada, dehakāntijanana, specially good for ladies, less powerful.

Napuṃsaka Vajra : Possess less *krāmaṇa* power, is without satva, useful for *klības* (impotents) only.

NĪLAM

Nīlamaṇi is aluminium oxide but contains traces of cobalt, which gives a blue colour to it. Colour of *Nīlam* is deep blue. Except for its blue colour and the trace element, there is no difference between *Māṇikya* and *Nīlam. Nīlam* also belongs to corundum group of stones. Good variety of sapphire is transparent and its colour varies from blue to white. Crystals are hexagonal, usually showing asterism. *Nilam* occurs in Burma, Sri Lanka, and India. In India it occurs specially in Jammu and Kashmir and near Vijayanagaram. Astrologically it is used externally in a ring for propitiating the planet *Saturn.* Physical characteristics of sapphire that should be used for this purpose are descriebd in astrological can *Āyurvedic* texts.

Śānskṛt	:	*Nīlam*
English	:	Sapphire
Hindi	:	Nilam
Chemical Formula	:	Al_2O_3
Hardness	:	9
Specific Gravity	:	4

Synonyms

Nīlopala, Nīla Ratna, Sunilaka, Mahanīla, Nīlāsma and Saniratna, Indranīla, Śakranīla, Kṛṣṇamṇī, Jalanīla.

Śodhana

In a *ḍolā yantra*, sapphire should be made *śwedana* by adding the juice of *nili* (indigofera tinctoria linn.) for three hours. There after, it should be washed with warm water and dried.

Māraṇa

Procedure prescribed for *māraṇa* of ruby should be followed for sapphire also.

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Pharmacological Properties

Karma	-	*Balya, vṛṣya, dīpana, rasāyana, medhya, hṛdya, tvacya, varṇya, viṣahara,* and *pāpaghna.*
Effect on Doṣas	-	It alleviates all the three *doṣas.*

Therapeutic Uses

Kāsa, svāsa, jvara, viṣama jvara, kuṣṭha, pāṇḍu, arśa, pāpajaroga, śanigrahajanya roga, yakṣmā, vātodara, mūrcchā, snāyuruk, kṛmī, pakṣāghāta, plihāroga, jīrṇa-jvara, sarvāṅgavāta, hastapādaprakampa.

Dose : 25 to 125 mg twice daily in empty stomach.

Anupāna : Honey

GOMEDA

Gomeda is the most favourite gem for the planet *(graha) Rāha* and may be used for wearing on the body or internally to please the *Rāhu graha* or to remove its *prakopa* (ill effects). *Gomeda* is calcium aluminium silicate in which calcium may be replaced partially by ferrous iron and aluminium by ferric iron. Its crystals are cubic, colour is dark brown or rose red. It is translucent to opaque having vitreous to resinous lustre. Its mineral is grossularite. Some scholars consider zircon (Zr SiO_4) as *gomeda.* Zircon is brown or greyish in colour, transparent to opaque, has tetragonal crystals and adamantine lustre. According to *Rasendra Cūḍāmaṇi* the colour of *gomeda* should resemble the colour of cow's fat and that is why it is named as *gomeda,* and this means it sould be light red in colour. *Nighaṇṭu Ratnākara* mentions that it is similar to *gomūtra* (cow's urine) in colour. *Gomeda* occurs in South Africa. Ukraine and Arizona. It does not occure in India. Astrologically it is used externally to propitiate the planet *Rāhu* (Dragon's head). Physical characteristics of the stone for Astrological use are described in astrological and *Āurvedic* texts.

Śānskṛt	:	Gomeda
English	:	Hessonite, Cinnamon Stone, Zircon
Hindi	:	Gomed
Chemical Formula	:	Ca Al (SiO_2) / $ZrSiO_4$
Hardness	:	6.5 to 7.5
Specific Gravity	:	3.5 to 3.7 (Zincon 4.65 to 4.71)

Synonyms

Gomedaka, Pinga Sphtika, Rāhu Ratna and Tamomaṇi

Varieties

Four varieties of *gomeda* based on colour and caste are described in *Rasa Kāmadhenu.* These are :

1. Whitish yellow - *Brāhmaṇa.*
2. Reddish yellow - *Kṣatriya.*
3. Yellow - *Vaiśya.*
4. Blackish yellow - *Śūdra.*

Śodhana

In a *ḍolā antra*, cinnamon stone should be made *śwedana* for three hours by adding lemon juice. There after, it should be washed with warm water and dried.

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Māraṇa

The procedure prescribed for the māraṇa of ruby should befolloed for cinnamon stone also.

Pharmacological Properties

Rasa	-	*Āmla*
Guṇa	-	*Uṣṇa*
Karma	-	*Dīpana, pācana, rucya, tvacya, atibuddhi-prabodhana, balya, pāpanāśana.*
Effect on Doṣa	-	*Kapha pittaghna, vātakapha vikāranut.*

Therapeutic Uses

Pāṇḍu, Kṣaya, Kaphavāta vikāra, Twak doṣa, Aruci.

Dose : 25 to 125 mg

VAIḌŪRYA

Vaiḍūrya is the most favourite gem of the planet *(graha) Ketu* and hence may be worn on the body or used internally to please the planet *Ketu* or to remove its *prakopa* (ill effects). Astrologically this gem is used externally in ring for propritiating the planet *Ketu* (Dragon's taill). For astrological use its appropriate physical characteristics are described in astrological and *Āyurvedic* texts. For the purpose of medicine, raw unpolished cat's eye is generally used. Chemically *vaidūrya* is berylium aluminium oxide containing BeO 19.8% and $A1_2O_3$, 80.2% with traces of iron and magnesium. Its crystals are orthorhombic, tubular or heart shaped, lustre is vitreous to greasy, colour is greenish white or greenish yellow, transparent to translucent, exhibits play of colours on exposure to sun rays. Its mineral. Cymophan is opalescent and has a yellow green colour, silky lustre and fibrous structure. Hence the name cat's eye is given to it. It also resembles garlic (*lehaśuna*) in appearance hence in Hindi it is called *lahaśuniyā*. It contains white shining line in the middle and in ancient taxts this is described as if it contains a white cloth like or white cloud like structure across the middle. On the basis of its shape and appearance *vaidūrya* may belong to two different groups, viz. 1. chrysoberyl or emerald group and 2. quartz group. The green fibrous variety, crocidolite, of quartz group is also known as Cat's Eye. It is an asbestos like substance and contains $FeSiO_3$, having a hardness of 4. It appears to be a secondary mineral.

Śānskṛt	:	*Vaiḍūrya, Viḍālākṣa, Mārjāranetra*
English	:	Cat's Eye
Hindi	:	*Lahusuniyā*
Chemical Formula	:	Be Al_2O_4
Hardness	:	8.5
Specific Gravity	:	3.6 to 3.8

Synonyms

Vidūra Ratna, Ketu Ratna, Vidūraja, Viḍalakhya, Viḍalakṣa and Vayaja.

Varieties

On the basis of colour - 1. White.
2. Smoky.

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3. Blackish.
4. Mixed coloured.

On the basis of caste	-	1. *Brāhmaṇa*	- Whitish blue
		2. *Kṣatriya*	- Whitish red
		3. *Vaiśya*	- Yellowish blue
		4. *Śūdra*	- Blue.

Śodhana

In a *ḍolā yantra*, *Vaiḍūrya* should be made *śwedana* for three hours by adding the decoction of *triphala*. There after, it should be washed with warm water and dried.

Māraṇa

The process of *māraṇa* prescribed or ruby should be followed for *Vaiḍūrya* also. It should be cooked in *gaja puṭa* for eight times.

Pharmacological Properties

Rasa	-	*Madhura*
Guṇa	-	*Śīta, Snigdha*
Vīrya	-	*Śīta*
Karma	-	*Dīpana, Pācana, buddhi/prajñāvardhana, āyuvardhana, balavardhana, paramabṛmhaṇa, medhya, netrya, malamocana.*
Effect on Doṣa	-	*Pittaghna*

Dose : 25 to 125 mg twice daily in empty stomach.

Anupāna : Milk.

Therapeutic Uses

Rakta pitta, Pittāmaya, Netraroga, Ketugrahajanya roga.

UPARATNA

Some *Uparatnas* (semi-precious stones) are also recognised for their medicinal values. The stones which are less hard, less shining, less transparent, and less costly are included in this group. The following substances of this group are found described in *Rasa Ratna Samuccaha.*

Vaikrāna	-	*Tourmaline*
Sūryakānta	-	*Sun stone*
Candrakānta	-	*Moon stone*
Rājāvarta	-	*Lapis lazuli*
Sphaṭika	-	*Quartz.*

Though the number of *Ratnas* (precious gems) are mentioned as nine in Ayurveda, there are so many difference of opinions regarding the number of Uparatnas (semiprecious stones) as under :

Anandakanda	-	9
Ayurvedaprakash	-	14
Brihatyogatarangini	-	4
Rasatarangini	-	6

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Rasajalanidhi - 7

1. Vaikrānta, 2. Sūryakānta, 3. Candrakānata, 4. Rājavarta, 5. Pairoja, 6. Sphaṭika, 7. Vyomaśma, 8. Palanka, 9. Rudhira, 10. Puttika, 11. Sugnadhika, 12. Triṇakānta are mentioned as semiprecious gems as per CCIM syllabus.

SŪRYAKĀNTA

Chemically sun stone is a combination of sodium, aluminium, silicon, oxygen and calcium. Its mineral is called Avanturine oligoclase which is somewhat red in colour with bright yellow or red reflections from the ingrained thin scales of hematite. Its crystals are triclinic, hardness is 5.5 to 6, sp. gr. is 2.65. It is translucent, exhibiting reddish flashes owing to the admixture of mica or other thin plate-like minerals. It is mentioned in ancient texts that owing to its reddish colour *sūryakānta* looks like burning charcoal when the sunrays fall on its surface. It is further said that when the sunrays accumulate on its particular part it becomes very hot and burns a thin piece of cotton or paper if this is brought near this part of the gem. Sun stone occurs in Burma, Russia, Norway and Madagaskar. Sun stone is the favourite gem of the *Graha Sūrya* and may be used for wearing on the body or internally for therapeutic purposes to please the planet.

Śānskṛt	:	Sūryakānta
English Name	:	Sun Stone
Hindi	:	Sūryakānt
Chemical Formula	:	$Na_2A1_2O_36SiO_2$ or $CaOA1_2O_32SiO_2$

Synonyms

Āgnigarbh, Tapamaṇi, Ravikānt, Arkopal, Tapan, Sūryakānta, Jawlnasam, Diptopal

Acceptable Variety

Sun stone of superior variety should be very clear, smooth, round, free from layers and holes and would look burning when in contact with intense sun-rays.

Inferior variety

Sun stone which does not have the above characteristics is of inferior variety.

Pharmacological properties

Guṇa	-	*Uṣṇa.*
Vīrya	-	*Uṣṇa.*
Karma	-	*Rasāyana, medhya, ravituṣṭikara.*
Doṣa prabhāva	-	*Vāta śleṣmahara.*

Māraṇa

Drugs - Śuddha manaḥśīlā and gandhaka.

Process - Heating by *puṭa system using seven gajapuṭas.*

CANDRAKĀNTA

Candrakānta is a combination of sodium, aluminium, silicon and oxygen but sometime it may contain potassium or calcium in place of sodium. It is a variety of Adularia and occurs usually in white or colourless crystals which are usually transparent or slightly cloudy and possess excellent

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opalescence. Its lustre is vitreous to pearl like. It comes under orthoclase group. Its crystals are monoclinic. A variety of Albite (Soda feldspar) showing bluish opalescence is also called Moon stone. Its crystals are triclinic, usually small and found in twins. These are colourless or grey. Its colour is bluish white but sometimes it may have many colours. In Moon rays it looks very beautiful, pleasing and very cold and shines like water. In ancient texts it is said about it that, it kept in moon rays it starts a secretion. But practically, it only gives such impression. Moon stone is the favourite gem of the planet Moon (*Candragraha*) and may be used for wearing or internally to please the planet Moon. It is one of the semiprecious stones and belongs to the group of quartzes. It is called Moonstone in English. It is also available in the peaks of Himalayas. It is acompound of sodium, aluminum, silica and Oxygen (NaAlSi3O8). It is a yellowhich white coloured stone, transparent , smooth, with out spots and emits drops of water due to the refraction of moon rays through itmoon.

Śānskṛt	:	*Candrakānta*
English	:	Moon stone
Hindi	:	*Candrakānt*
Chemical Formula	:	$NaA1Si_2O_8$ or $KA1Si_2O_8$

Synonyms

Śaśikanta, Śaśimaṇi, *Candrakānta, Candamaṇi, Indukānta, Candropal and Śitāśma.*

Availability

Moon stone occurs in Sri Lanka, Burma and Madagaskar.

Acceptable variety

Moon stone which is smooth, yellowish from all sides, cold to touch, clear, free from *trāsa doṣa,* gives an impression of secretion in the moon light is of acceptable variety.

Inferior variety–Moon stone not possessing the above characteristics is inferior.

Māraṇa

Add equal parts of *manahśila* and *hiṅgula* to the powdered *Candrakānta* and pound well with *kumāri swarasa* and then sunject it to heat by means of *puṭa.*

May be done by the method used for Sun stone.

Pharmacological Properties

Guṇa	:	*Snigdha, Śīta*
Vīrya	:	*Śīta*
Karma	:	*Asranut, tāpanut, śivaprītikara.*
Effect on Doṣa	:	*Pittanut*

Therapeutic Uses

Raktavikāra, pittavikāra, dāha, santāpa, raktapitta, graharoga, tāpa.

RĀJĀVARTA

Rājāvarta is a combination of sodium, sulphur, aluminium, silicon and oxygen. It is known as a sulphur containing silicate complex. It is also known as ultramarine which is bright blue in colour. Its crystals are cubical, fracture uneven, lustre is vitreous to greasy, appearance is opaque to translucent. It is a contact mineral and occurs in crystalline lime stone. Lapis lazuli occurs mostly in Persia,

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Turkistan, Afghanistan, Russia and India (near Ajmer). It is also made artificially in Germany. *Rājvārta* is a semi precious stone having blue with reddish and greenish tinge. It is a compound of sodium, aluminum, silicon. Clear, heavy, smooth, bright, bluish, peacock neck coloured one is considered to be the best *Rājvārta*.

Śānskṛt	:	*Rājāvarta*
English	:	Lapis Lazuli
Hindi	:	Lājvart
Chemical Formula	:	Na_4 (NaS_3 A1) $A1_2$ SiO_4
Specific Gravity	:	2.4 to 2.8
Hardness	:	5.5

Synonyms

Nṛpāvarta, Āvrtamaṇi and Nīlaśma, Āvrta, Nṛpopal, Nṛpāvart, Rājāvarta

Varieties

It is of 2 types

According to form - *Cūrṇa Rūpa, Piṇḍa Rūpa.*
Guṭikā svarupa, Cūrṇa svarupa.

According to colour -*Rakta* (red), *Nīla* (blue), *Miśrita* (mixed colour)

According to source -Natural, Artificial.

Acceptable variety

Rājāvarta which is blue with reddish tinge, heavy, smooth or oily, very clear, bright, sky coloured or of colour similar to peacock's neck or black is superior.

Inferior variety

Rājā Varta which does not possess the above characteristics is inferior.

Availability

It is available is Afghanistan, Russia, Germany, Burma, and Rajasthan of India.

Śodhana

1. *Rājvārta* is purified, if it is made *Svedana* in *dolāyantra* for one *yāma* with *Jambira Swarasa, Yavakṣāra Drava, Gomūtra* with *kṣāra, āmla drava, śiriṣa puṣpa rasa, mahiṣī kṣīra* with *goghṛta ārdraka rasa.*
2. *Pācana* in *lohapātra.*
3. *Bhāvanā* two to three times with some of the above liquids.

Māraṇa

Take equal parts of *Śuddha Rājvārta* and *Gandhaka* and pound well with *Jambira swarasa* and dry in the sunlight. Then keep in *śarāva saṁpuṭa* and subject it to heat by means of *Gajapuṭa* for 8 times.

Satvapātana

Drugs - *Manahśilā, ghṛta, mahiṣikṣira, mitrapañcaka.*

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Method - Mix all well, heat in an iron pan till dry, then add *mitrapañcaka* and prepare round balls. Put these in a *mūṣā* and apply strong heating using *khadirāṅgār.*

Colour of *satva* - Not mentioned.

Pharmacological Properties

Rasa	-	*Kaṭu, Tikta.*
Guṇa	-	*Snigdha, śīta.*
vīrya	-	*Śīta.*
Karma	-	*Dipana, pācana, vṛṣya, Gṛṁhaṇa, rasāyana, viṣāpaha.*
Doṣa Prabhāva	-	*Ślesmahara, anilāpaha, pittanāśana.*

Therapeutic Uses

Prameha, kṣaya, pāṇḍu, arśa, chardi, meha, mūrcchā, śoṣa, madātyaya, hikkā, dāha, clama.

Madātyaya : Take equal parts of *Rājvārta bhasma, rajata bhasma and swarṇa mākṣika bhasma* and process them with goghrita. Then it is to be given by given by adding *khaṇḍa śarkara* and *madhu* to relieve the complications of *madātyaya.*

Formulations

Rāmabaṇa rasa, Sanjivani Rasa, Tāpyadi vaṭi

SPHAṬIKA

Sphaṭika is the most favourite gem of *Lord Śiva.* Hence if a garland (*mālā*) made of its round pieces is worn or used for uttering the name of *Lord Śiva* its effect becomes milion times more for pleasing *Lord Śiva.* It is a combination of silica and oxygen, but sometimes contains other elements in trace which imparts various colours to it. Pure quartz consists of 45.7% Si and 53.3% O. Massive varieties often contain calcium, iron, copper, clay and other impurities. It occurs is distinct crystals which are commonly prismatic, hexagonal or trigonal, its lustre is vitreous to greasy. Pure specimens of quartz are transparent and colourless but most varieties are coloured due to impurities. It occurs abundantly throughout the world. *Sphaṭika* is a semi precious stone, It is clear, tranmsparant, colorless perfectly shaped and having 6 surfaces and 6 angles.

Śānskṛt	:	*Sphaṭika*
English	:	Quartz/Rock-Crystal
Hindi	:	Phitkari
Chemical Formula	:	SiO_2

Synonyms

Sphaṭikopala, bhāsura, dautopala, śitopala, śālipiṣṭa, amalamaṇi, kācamaṇi, śivaratna.

Varieties

Acceptable variety–*Sphaṭika* which is white as *Gaṅgā* water, very bright, without layers, smooth, cool to touch, very clear, not loosing brightness even after rubbing or breaking and looking very beautiful is of acceptable variety.

Inferior variety–*Sphaṭika* which does not possess the above characteristics is inferior.

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Availability

In India it is available at Jabalpur and Gujarat.

Pharmacological Properties

Rasa	-	*Madhura.*
Guṇa	-	*Atiśīta, snigdha.*
Vīrya	-	*Śīta, samavīrya* (neither *śīta* nor *uṣṇa*).
Karma	-	*Hṛdya, netrya, balya.*
Doṣa prabhāva	-	*Pittahara.*

Therapeutic Uses

Dāha, raktasrāva, raktapitta, jvara, pittaroga, śoṣa.

Śodhana and *māraṇa* may be done following the method employed for *rājāvarta.*

PAIROJAKA

According to Ayurvedic Texts it is blue with a greenish tinge or green with a yellowish tinge. When it comes in contact with Sunrays or heat its colour dimnishes. Its blue colour is due to the presence of copper and the greenish tinge is due to iron. It is a semi precious stone having yellowish green or greenish blue colour. It is a compound of phosphate of Aluminum, Iron and Copper. Bluish tinge is attributed to the presence of copper.

Śānskṛt	:	*Pairojaka*
English	:	Turquoise
Hindi	:	*Piroja*
Chemical Formula	:	(Cu OH) Al (OH) Z) $6H_5 (PO_4)_4$)
Hardness	:	5-6
Sp. Gr.	:	2.61 to 2.89

Synonyms

Haritāśma, Peroja, Pairojaka, Pairoj Viṣarārti, Harinmaṇi.

Varieties

Basing on the colour, it is of two types.

Bhasmānga (Ash coloured) *Harita* (Green colured)

Availability

It is available in Iran, New Mexico, Persia, Egypt, Turkey, china, Tibet, Burma, America etc. In India it comes from Iran.

Śodhana and Māraṇa

Similar to *rājāvarta.*

Pharmacological Properties

Rasa	:	*Kaṣāya, Madhura*
Guṇa	:	*Śīta, Sara*

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Vīrya : *Śīta*

Karma : *Dīpana, Sara, Hṛdya, Sthāvara, Jāngama and Kṛtrima, Viṣahara, Agnivardhaka.*

Therapeutic Uses

Śūla, Dūsīvisa, Sthāvara viṣa, Jangama viṣa, Carācora viṣa, Malarbhūtādi dosaja viṣa, Netraroga, Aśmarī, Āntravarana, Hṛtspandana.

PĀLANKA

Pālanka is a semi precious stone having black colour with white lines and resemble closely with hessonite (Gomeda). It is having smooth surface and brillient lustre. It is a kind of Agate.

Śānskṛt : *Pālanka*

English : Onyx

Varieties

On the basis of colour it has three varieties

1. Black
2. Pale black
3. Ash coloured

All the 3 varieties contain white lines. Gives wealth on wearing this stone.

RUDHIRA

It is a hard stone. *Rudhira* is one of the semi precious stones and having the colour of insect *indragopa* or the beak of a parrot i.e. red colour.

Śānskṛt : *Rudhira*

English : Carnelian

Hindi : Rudhira

The central part of the gem is whitish (moon like) in colour and the periphery is bluish in colour similar to that of saffire. It has a pure colour and with several shapes. *Rudhira* is having the weight of ripened fruit of a *pilu*. *Rudhira*, after full development appears as bright as a diamond. Those wearing the gem *rudhira* will be wealthy and handsome.

PUTTIKĀ

Puttikā is a semi precious stone. It is yellowish green in colour and looks like emerald, it as an undeveloped softest stone having yellowish green colour and brillient lustre. It is a soft form of under developed emerald.

Śānskṛt : *Puttikā*

English : Peridote

Hindi : *Puttika*

If rubbed with a silk cloth *putrika* looses its luster, where as emerald becomes brighter. This is the simple test to identify both the gems.

SUGANDHIKA

This is a hard stone and it is a Magnesium Aluminate i.e. contains Magnesium, Aluminium and oxygen. *Sugandhika* is one of the semi precious stones and it is available in the mines of rubies and

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emeralds.

Śānskṛt	:	*Sugandhika*
English	:	Spinal
Hindi	:	Sugandhika

Basing on the colour it is of various types such as *nila* (blue), *rakta* (red), *Kṛṣṇa* (black) etc. yellowish tinge is seen in all the varieties of *sugandhika*. The best one is clear and transparent such as a diamond.

TṚṆAKĀNTA

(रसतंत्रसारा सिद्धा प्रयोगसंग्रह भस्मप्रकरण ३३/२०९)

Triṇakanta Maṇi is a fossil resin. It is a pharsi term which means kaha=Dried grass and *ruvā*=attractor, that is which attracts dried grass. *Triṇakanta Maṇi* means it looks like dried grass (yellowish) in colour. If it is rubbed on woolen cloth electric current is produced and by virtue of this it attracts dried piece of grass or cotton if brought near to it. If it is rubbed on cloth a smell similar to lemon is produced.

Śānskṛt	:	*Triṇakānta Maṇi, Tṛianakānta*
English	:	Amber
Hindi	:	Kaharuva
Latin	:	Succineum
Hardness	:	2-2.5
Sp. Gr.	:	1.1

Synonyms

Tṛṇakanṭamaṇi, Tṛṅagrāhi, Tṛṇakanṭa

Availabilty

It is available in the countries like Burma, Rumania , Italy. In India it is available at Trivandrum, Kuch and in the forests of Nicobar.

Śodhana and Māraṇa

As it is plant product, there is no need of purification and incineration.

It may be used in *Piṣṭī* or *Bhasma* form. It is recommended along with other heamostatic drugs in cases of heamorhages.

Piṣṭi

Steep *Tṛṇakanṭa* in rose water for 2 to 3 days and grind well . In this process fine white coloured powder is obtained which is called *Tṛṇakanṭa Piṣṭi*.

Pharmacological Properties

Rasa	:	*Madhura*
Guṇa	:	*Sīta*
Virya	:	*Śīta*
Karma	:	*Hṛdya, Balya, Netrya, Raktastambhaka*

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Vipāka : *Madhura*

Dose : 240 to 480 mg.

Anupāna : *Rūmimastangi cūrṇa, madhu, dūrvaswarasa,* fresh butter, milk, *water.*

Therpeutic Uses

Raktapitta, raktapradara, raktātisāra, raktārśa, raktaṣṭhīvana, urahkṣata, śirahśūla and heart palpitation, *raktapravāhika,*.

Raktārśa : Tṛṇakanṭa piṣṭi is to be given with *bola parpaṭi* and *drākṣāvalehya* in the management of *Raktārśa.*

Dourbalya : If *Tṛṇakanṭa piṣṭi* is given with *abhraka bhasma, guḍūci satwa* and *nāgakeśara cūrṇa*, it relieves *dourbalya* due to *raktārśa* and *raktapradara.*

Properties accroding to Unani Medicine

Triṇakanta Maṇi is neither hot nor cool. It is *rūkṣa* in second stage. Produces happiness, gives strength to heart, stomach and intestine. It is astringent and haemostatic in action and may be used in cardiac weakness, palpitation, Epistaxis, haemoptisis, bacillary dysentry, bleeding piles, menorrhagia and *urakṣata* either alone or with other medicines. For strengthening intestine and stomach it is used with *mastangi* powder. It stop's bleeding from injured part by sprinkiling. It is used in the form of *piṣṭi* prepared with rose water of sandal wood water. It's *bhasma* is not generally prepared.

SANGE YASABA

It is avery hard stone which comes from *yārakand* to India through *Laddākh* and *Kaśmīr.* It is yellowish grey, green or greenish white in colour. They yellowish green and hard variety is considered best. It is used to make mortars which are considered good for making *piṣṭi's* of gems.

Śānskṛt	:	Sange Yasaba, Hauladili
English	:	Zade
Hindi	:	Sange Yasaba
Pharsi	:	Yasama, Sange Yasaba

Śodhana

In a *Ḍolā yantra*, zade is cooked by adding lemon juice for three thourse. There after, zade should be washed with warm water and dried.

Māraṇa

Zade is generally used in the form of *piṣṭi*. For this purpose it is triturated yadding rose water till it is reduced to a very fine powder form which takes about ten days.

Pharmacological Properties

Virya - *Śīta*

Dose : 125 to 250 mg.

Anupāna : Milk or fresh butter.

According to Unani medicine it is cool in first stage, *rūkṣa* in second stage and gives tone to heart and stomach. It is used in cardiac weakness, palpitation, gastric pain, indigestion, *pravāhikā* (dysentry), burning micturation and urinary calculus. It can cure internal wounds and stops bleedings. It's bhasma or *piṣṭi* is especially indicated in cardiac weakness.

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Therapeutic Uses

It is useful in the treatment of heart diseases, colic pain, buring micturation, and stone is urinary tract.

AKIKA

It is a hard and red coloured semiprecious stone. It is of many colours and the red agate is considered best. It contains 70-90% silica and in remaining portion it contains Aluminum, Iron oxide or Manganese oxide. *Sange sulemani* (onyx) opal and *lahasunia* (*vaiḍūrya)* are also the varieties of *Akīka.* It is used in *piṣṭi* or *bhasma* form. It is a chalcadony made up of *strets* or bands indicating successive stages of deposition. The layers may be differently coloured or clouded giving rise to several varieties known as banded or clouded agates. The bending is usually parallel but has more or less wavy or irregular lines. Agates are white, Pale to dark brown or bluish in colour. According to the *Āyurvedic* view the red coloured *Akīka* is considered to be the best.

Śānskṛt	:	Akika
English	:	Agate
Hindi	:	Akik
Chemical Formula	:	SiO_2
Hardness	:	7.2
Sp. Gr.	:	2.65

Śodhana and Māraṇa

Agate should be cooked for three hours in *Ḍolā yantra* by adding lemon juce. There after it should be washed, dried, made to small pieces and use for *bhasma* or *piṣṭ*. The procedure in this connection prescribed for ruby should also be adopted for agate.

Pharmacological Properties

Rasa : *Ununctuous and aphrodisiac.*

Virya - *Śīta*

Dose : 250 to 500 mg.

Anupāna : Milk or fresh butter.

Therapeutic Uses

It is useful in the treatment of *rakta, pitta* (a diseases characterized by bleeding from different parts of the body) and diseases of the heart gum as well as teeth. It is also useful in the treatment of stone in the urinary tract.

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Chapter 11

SUDHA VARGA

MṚGA ŚṚNGA

Mṛga Śṛnga is known since *Vedic period*. In *Ṛgveda* the word *Śṛnga* has been denoting the meaning of an animal horn. Thats why in *Atharvaveda* the sharp end of an arrow is named as its '*Śṛnga*'. In *Suśruta Saṁhitā*, śṛnga has mentioned in the category of *śalya*. *Suśruta* has also mentioned a *yantra*, named as '*Śṛnga Yantra* 'for *Rakta Mokṣana*. In *Aṣṭānga Hṛdaya, Vāgbhatta* has used *Śṛnga* to treat *śwasa, kāsa* in the form of *Dhūmapana*. He has also mentioned a *yantra*, named as *Śṛnga Yantra*. In *Śarṅgadhara Saṁhitā* '*Śṛnga*' has mentioned to extract '*Satwa*' from *Dhātus*. He was also mentioned a few '*Śṛnga*' containing *yogas* i.e., '*Mṛga Srnga Puṭa Pāka, Jwarāmkusa Rasa, 'Trinetra Rasa', 'Trinetra Rasa', 'Grahaṇi Kapāṭa Rasa*' and *Kandarpa Sundara Rasa'*, for various conditions. *Sri Bhāva Miśra* has mentioned *Sṛnga bhasma* along with *Ghee* in '*Hṛta Sūla*' in his text book *Bhāva Prakaśa. Yasodhara Bhaṭṭa* has mentioned *sṛnga* to extract *satwa 'Abhraka'* in the text *Rasa Prakasa Sudhākara, śṛnga* also was an ingredient in '*Jwāramkusa Rasa*', '*Trinetra Rasa*' and *kandarpa sundara Rasa*, used for *Vāta Jwara*, *Arśa* and *'Virya Vṛddhi'* respectively. The author has mentioned a few *yogas* containing '*Sṛnga*' for various diseases in *Rasendra Sāra Samgraha. Ācarya Govinda Dāsa Sena* has mentioned a number of *yogas* containing '*Sṛnga*' for various disorders in his text *Bhaiṣajya Ratnāvali. Sri Sadānanda Sarma* in his text *Rasa Taraṅgiṇi* has mentioned the synonyms, acceptable quality of '*Śṛnga*' elaborately. He was also described *Māraṇa of Śṛnga*.

Śānskṛt	:	Mṛga Śṛnga
English Name	:	Deer Horn
Hindi	:	Vishan Singh

Synonyms

Mṛga Śṛnga, Eṇa śṛnga, Mṛga Viṣāṇaka, Hariṇa Śṛnga.

Acceptable Variety

The *Śṛnga*, which is long, multibranched, hard and heavy in weight should be collected. *Śṛnga* should not be infected by insects.

Māraṇa

मृगशृङ्ग समादाय करपत्रेण कर्तयेत् । खण्डशः कारयित्वा च त्वङ्गराग्नौ दहेत्ततः ।।
सुदग्धञ्चाथ विज्ञाय खल्वे सञ्चूर्णयेद्भिषक् । रविदुग्धेन सम्पेष्य चक्रिकाः कारयेत्ततः ।।
शरावसम्पुटान्तःस्थं पुटेत्तीव्राग्निना भिषक् । त्रिवारं पुटनादेणविषाणं मृतिमाप्रुयात् ।।

(रसतरं. १२/१०७)

The detail description about the preparation of *Srnga Bhasma* is available in *Rasa Tarangini* and *Dravya Guna Vijnan-II, Page 418.*

Method : Keep the pieces of *śṛnga* in a *śarāva* and heat it. Allow for self cooling and make it into powder. Make pellets by using *Arka Kṣīra or Kumāri Śwarasa, Arka Kṣīra (D.G-II, Page 418)* and dry. Later keep the pellets in a crucible and cover with another crucible and repeat the process for 3 times by this method white coloured *srnga bhasma* can be prepared.

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Therapeutic Uses

मृगशृङ्गसमुद्भूता विभूतिर्गव्यसर्पिषा । विनाशयेत् क्षणादेव हृच्छूलमतिदारुणम् ।।
हरिणविषाणसमुत्था भूतिः क्षौद्रेण रक्तिमिता । अपहरतीह निकामं हृच्छूलं पार्श्वशूलञ्च ।।
(रसतरं. १२/१०८-१०९)

Śṛnga bhasma has been indicated in *Hṛd Śūla*, *Pārśwa Śūla*, *Hikka*, *Śwāsa* and *Śirah Śūla*.

Dose : 1-2 Ratti

Anupana : *Madhu, Ghṛta* and *Godugdha* etc.

ŚAMBŪKA

The description of *Śambūka* is abailable from *Saṁhitā* period. In *Śārngadhara Saṁhitā*, '*Sambūka Taila*', prepared by using the flesh of *Śambūka*, has been used to treat *vraṇa*. *Śri Bhāva Miśra* has included *Śambūka* in *Kośastha*' (which are covered by shell) group of animals. He has also indicated *Sambūka Bhasma* for *śūla* to get immediate relief. *Ācārya Mādhava* in *Āyurveda Prakāśa*, has described the synonyms, therapeutic indications, *śodhana* and *māraṇa* of *sambūka*. Like *Ācārya Mādhava*, *Śri Sadananda Śarma* has also described the synonyms, *śodhana, māraṇa* and therapeutic indications of *śambūka* in his book *Rasa Tarangiṇi*.

Synonyms

Kṣudra Śankha, Śankhanaka, Śambūka, Swalpa Śankha. Sullaka, Nakha Śankha etc.

In Indian system of Medicine it is seldom used. The actions of *Sambūka* are almost similar to *Śankha* and *kapardika*.

Pharmacological properties

Rasa	:	*Kaṭu, Kaṣāya*
Guṇa	:	*Tikṣṇa, Khara*
Vīrya	:	*Śīta*
Vipāka	:	*Madhura*
Karma	:	*Dīpana, Pācana, Grāhi*

Śodhana and Māraṇa

Śodhana of *Śambūka* should be done in *Nimbu Swarasa* by doing *śwedana*. *Māraṇa* of *Śambūka* should be done like that of *Śankha Māraṇa*.

Therapeutic Uses

Samgrahiṇi, Udara Śūla, Netra Roga and *Raktātisāra*.

Dose : 2 Ratti

Anupāna : *Nimbu Śwarasa or Uṣṇa Jala*.

Formulations

Śambūka Taila, Śambūka Bhasma.

KHAṬIKA

There is no description about *khaṭika* in *Vedas*. A little description is available in *saṁhitas* and *Rasa Śāstra* texts. *Bhāva Miśra* has included *khaṭika* in *Uparasa Varga Śri Yaśodhara Bhaṭṭa* in *Rasa*

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Prakāśa sudhākara has mentioned the *khaṭika* for the preparation of *Rasa Karpūra*. He has also used *khaṭika* for the *śodhana* of *Swarṇa*. He has used the word *khaṭika* to describe the white variety of sulphur. *Vāgbhaṭṭa* in his text book *Rasaratna Samuccaya* has also used the word *Khaṭika* to describe the white variety of sulphur. In *Āyurveda Prakaśa, Ācārya Mādhava*, has included *khaṭika* in '*Uparasa* Group. He also described the synonyms, varieties and therapeutic indications of *khaṭika*. *Śri Sadānanda Sarma* in his text *Rasa Taraṅgiṇi*, has described the synonyms, varieties and therapeutic indications of *khaṭika*. *Sri Sadananda Sarma* in his text *Rasa Taraṅgiṇi*, has described the synonyms, varieties and purification method along with it's therapeutic indications.

Śānskṛt	:	Khaṭika
Hindi	:	Khaṭika

Synonyms

Khaṭika, Khaṭini, Lekhani, Lekhanamṛttika, Khaṭinika, Varnika, Varna Lekhika.

Varieties

It is having two varieties:

1. *Khaṭi*
2. *Goura Khaṭi*

Khaṭi is said to be contain impurities. *Goura Khaṭi* is of white in colour and heavy in weight. It is tasteless and stick to the tongue.

Śodhana

Śodhana process of *khaṭika* has been described in *Rasa Taraṅgiṇi*.

Procedure

Take the powdered *khaṭika* in a bowl and add water. After mixing leave the bowl to settle *khaṭika*. Later decant the water and make the residue dry and use.

Pharmacological properties

Rasa	:	*Madhura, Tikta*
Guṇa	:	*Śīta*
Virya	:	*Śīta*
Karma	:	*Grāhi, Dāhahara*

Therapeutic Uses

Atisāra, Netra Roga, Śotha, and Vraṇa.

Dose : I Maṣa

Anupāna : Śītajala.

Formulations

Khaṭikādi Peya, Mugdha Rasa.

SAMUDRA PHENA

The description of *Samudra Phena* in literature is available from *saṁhitā* period. In *Caraka Saṁhitā*, it has been widely used in the form of *varti* i.e. *Sukhavaṭi Varti, Dṛṣṭi Pradhāna Varti*', to

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treat *Kāca* and *Timira* (eye disorders). *Suśruta*, in his text *Suśruta saṁhitā* has been used *Samudra Phena* as a *lekhana sādhana*. He has also used *Phena* in a number of eye disorders. *Vāgbhaṭṭa in Aṣṭānga Hṛdaya* has also used *Samudra Phena* widely in eye diseases. In *Śārngadhara Saṁhitā, Phena* was used as an ingredient in *Lekhana Cūrṇa Anjana*, used for *kāca*, *kaṇḍu* and *kaphaja netra roga*. *Bhāva Miśra*, in his text *Bhāva Prakāśa* has described the synonyms and therapeutic indications of *Samudra Phena*. He was also used the *phena* to treat eye diseases. As described in *Rasa Prakāśa Sudhākara, Phena* was an ingredient in *Vāta Nāśana Rasa* used for *Vātaja disorders*. *Ācārya Mādhava*, also described the synonyms, therapeutic indications and purification method of *phena* in *Āyurveda Prakāśa*. The author has described the qualities, purification method and bad effects of unpurified *samudra phena*, in *Yoga Ratnākara*. Like *Ācārya Mādhava*, Sri *Sadānanda Śarma* has also described the synonyms, purification mentod and therapeutic indications of *Samudra Phena* in his text *Rasa Taraṅgiṇi*. It can be described as the dried foamy substance seen floating on sea surface. Originally the source of *phena* is a sea- creature.

Śānskṛt	:	Samudra Phena
English Name	:	Cuttle Fish
Hindi	:	Samudra Phen

Synonyms

Samudra Phena, Phena Saphena, Phenaka, Abdhiphena, Dindira, Abdhikapha, Abdhija, Samudraja.

Śodhana

Purification of *Samudra Phena* has been described in *Rasa Taraṅgiṇi* and *Āyurveda Prakaśa*. The hard external portion of *Samudra Phena* should be scrapped and make powder. Later *Triturate* with *Nimbu Swarasa* for one day and dry it. *Āyurvedic* classics have not mentioned the *māraṇa* process of *Phena*. Purified *Samudra Phena* can be used internally and externally.

Pharmocological properties

Vīrya	:	*Śīta*
Effect on Doṣa	:	*Kapha Nāśaka*
Karma	:	*Lekhana, Dīpana, Pācana*

Therapeutic Uses

Karṇa Śrāva, Śūla, Viṣa Doṣa, Netra roga and Kuṣṭha Roga.

Dose : 2 Ratti

Anupāna : *Madhu or jala,*

Formulations

Śukhavaṭi Varti, Dṛṣṭi Pradhāna Varti, Danta Varti, Nayansonanjanam, Maha Nila Guṭika

SUDHA

Description available about *Sudha* from *saṁhitā* period. In *Caraka Saṁhitā, Caraka* has considered *Sudha* as *Pārthiva Dravya*. *Ācārya Suśruta*, has used *Sudha* to prepare *Pratisārāṇiya Kṣāra* in *Suśruta Saṁhitā*. In *Rasārnava*, the author has included *Sudha* in *Sukla*. *Śri Sadānanda Śarma* has described the synonyms, process to prepare *Cūrṇodaka* (Lime water) and therapeutic indication of

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Curṇodaka in his text *Rasa Tarangiṇi*. *Sudha* can be procured by heating lime stones. Procedure for the preparation of *Cūrṇodaka* has been described in *Rasa Tarangiṇi*.

Śānskṛt	:	Sudha
English Name	:	Lime
Hindi	:	Chuna
Chemical Formula	:	$CaCO_3$

Synonyms

Cūrṇa, Cūrṇaka, Sudha, Śilākṣāra.

Curṇodak (lime water)

Five *tolas* of water should be added to two *ratti* of lime in a bowl and left for twelve hours. Later filter the fluid through filter paper. Keep in a coloured bottle and cork it.

Therapeutic uses

Atisāra, Āmlapitta, Udara Śūla, Kṛmi and *Grahaṇi.*

Dose : I drop- 60 drops (for 1 year child), 2 *tola* (for adults)

Formulations

Sudha Parpaṭi useful in *Mukhaduṣika, Piḍaka* etc.

MUKTA

Based on the synonyms of *Mukta* it can be said that the origin of *Mukta* is *Śukti*. *Mukta* is claimed to be related with *Candra Graha* and may be used for wearing to please *Candra Graha*. Mythologically pearls are supposed to have originated from the broken parts of teeth of the demon *Bala*. It is believed that if a drop of rain water falls inside a *Śukti* floating in the sea water in *Svāti Nakṣatra*. The drops turn into pearl of good quality. The knowledge of *Mukta* is known in India since long time. There are several references in *Sri Madbhāgavat, Mahābhārata,* about *Mukta*, which was used for wearing purpose. The internal usage of *Mukta* can be from *saṁhitā* period. In *Caraka Saṁhitā*, *Mukta* is an ingredient in', used to enhance memory and strenghth. *Mukta* is also indicated in Dāha Jwara (fever and burning sensation). *Mukta* was an ingredient in *Muktādi Cūrṇa*. Used for Hiccough, Asthma and Cough. *Caraka* has advised to wear it in *Grīṣma Ṛtu*. *Suśruta* has included *Mukta* in *Pārthiva, Auṣadhi* and mentioned as *Cakṣuṣya* in his text *Suśruta sṁhita*. *Vāgbhaṭṭa* has mentioned *Mukta* in *Kaṣāya Skandha* in his text *Aṣṭanga Hṛdaya*. *Śārngadhara* has described the *śodhana* of *Mukta* in his text *Śārngadhara Saṁhitā* and mentioned the few *Mukta* containing *Yogas*. *Bhāva Miśra* has mentiond synonyms, therapeutic uses , *Śodhana* and eight *yoni* of *Mukta* in his text *Bhāva Prakaśa*. *Śri Somadeva* included *Mukta* in *Navaratna* group and described acceptable , non- acceptable qualities along with therapeutic indications of *Mukta* in his text *Rasendra Cūdamaṇi*. *Yaśodhara Bhatta* in his text *Rasa Sudhākara*, has included *Mukta* in *Navaratna* and described the acceptable, non- acceptable qualities, five *ratna doṣas*, *śodhana* and *māraṇa* of *Mukta*. He has mentioned a few *Mukta* containing *Yogas* and described a method to prepare artificial perals. *Vāgbhaṭṭa*, has also described qualities of superior and inferior varieties and therapeutic indications of *Mukta* in his text *Rasaratna samuccaya*. In *Rasa Kāmadhenu* and *Rasendra Sāra Sangraha* the authors have mentioned a number of *yogas* containing *Mukta* for various disorders. *Ācārya Mādhava*, has also included *Mukta* in *Nava Ratna* and *Maha Ratna* group. He has also described the eight origins (*Yoni*) of *Mukta*, four *mahadoṣas*, six *sāmanya doṣas*, their effects and there types of luster i.e., *Madhuchāya, Sitachāya* and *Srikandachāya*, of *Mukta*

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in his text *Āyurveda Prakaśa. Ācārya Govind Dāsa Sena* mentioned a number of *Mukta* containing *yogas* for various ailments in his text *Bhaiṣajya Ratnāvali. Śri Śadānanda Śarma* has described the synonyms, acceptable, non- acceptable qualities, *Śodhana* and *Māraṇa* along with therapeutic indications of *Mukta* elaborately in his text *Rasa Taraṅgiṇi.*

Śānskṛt	:	Mukta
English Name	:	Pearl
Hindi	:	Moti
Chemical Formula	:	$CaCO_3$

Synonyms

Mukta, Mukta Phala, Suktija, Souktikeya, Sasi Ratna, Sasipriya.

Varieties

द्विपभुजगशुक्तिशंखाभ्रवेणुतिमिसूकरप्रसूतानि । मुक्ताफलानि तेषां बहुसाधु च शुक्तिजं भवति ।। (वृ.सं. ८०/१)

शुक्तिःशंखो गजः क्रोडः फणी मत्स्यश्च दर्दुरः। वेणुश्चाष्टौ समाख्याताः सुज्ञैर्मौक्तिकयोनयः।।

(आयु.प्र. ५/१३)

According to origin it is of eight types. These are:

1. Meghaja *2. Śankhaja*
3. Bamsaja *4. Varāhaja*
5. Hastija *6. Minaja*
7. Phanija *8. Sukija*

रूक्षाङ्गं निर्जलं श्यावं ताम्राभं लवणोपमम् । अर्धशुभ्रं च विकटं ग्रन्थिलं मौक्तिकं त्यजेत् ।।

(र.र.स. ४/१६)

Acceptable Variety

नक्षत्राभं वृत्तमत्यन्तमुक्तं स्निग्धं स्थूलं निर्मलं निर्व्रणं च ।
न्यस्तं धत्ते गौरवं यत्तुलायां तन्निर्मौल्यं मौक्तिकं सौख्यदायि ।। (आ.प्र. ५/९५)

The pearls which are like a star or rays, smooth, clear, round, light, big in size , pleasing and looking like clear water are superior and these should be accepted.

ह्लादि श्वेतं लघु स्निग्धं रश्मिवन्निर्मलं महत् । ख्यातं तोयप्रभं वृत्तं मौक्तिकं नवधा शुभम् ।।

(र.र.स. ४/१३)

The pearls, which are rough, uneven, blackish in colour, lusterless, dirty, opaque, half white, and contains nodules should be rejected.

Good quality pearls

Pearls should be rubbed with the husk of rice and then washed with salted cow's urine. If no change is observed, the pearls are considered of good quality.

Śodhana

जयन्तीस्वरसेनेह दोलायन्त्रे विधानतः। यामैकं सततं स्विन्नं मौक्तिकं शुद्धिमाप्नुयात् ।।

(रसतरं. २३/६७)

Different drugs and techniques for purification of *Mukta* as described in various classics are presented in summarized form as follows.

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Name of drug used for śodhana	Technique/ time	Reference
Jayanti Swarasa	*Śwedana*/3 hrs	Sa. S.-M.k.11/87 Ra.Pr.Su-7/ 54 R.T. 23/ 67 Ra.Cu.-12/ 54 Y.R. Page 131
Agastya Rasa	*Śwedana*/3 hrs	R.T. -23/681/87

Māraṇa

मुक्ताफलन्तु तरुणीपरिस्रुतजलान्वितम् । पिष्टं त्रिवारं पुटितं मृतिमाप्नोत्यनुत्तमाम् ।।

(रसतरं० २३/७१)

Different *Rasa texts* have mentioned various *māraṇa* processes with different *bhāvana drugs*.

Text	Name of drug Used formarana	Yantra	No. of Patas
Śārngadhara Saṁhitā	*Kumāri Swarasa*	*Śarāva Saṁpuṭa*	-
Rasendra Cūramaṇi	*Kumāri Swarasa*	*Śarāva Saṁpuṭa*	2
Rasa Prakāśa Sudhākara	*Taruṇi Sruta*	*Śarāva Saṁpuṭa*	2
Rasa Taraṅgiṇi	*Godugdha*	*Śarāva Saṁpuṭa*	3
Rasa Taraṅgiṇi	*Taruṇi Sruta*	*Śarāva Saṁpuṭa*	3

Pharmacological properties

यद्विच्छायं मौक्तिकं व्यङ्गकायं शुक्तिस्पर्श रक्ततां चाति धत्ते ।
मत्स्याक्षीकं रूक्षमुत्ताननिम्नं नैतद्धार्यं धीमताऽसौख्यदायि ।। (आ.प्र. ५/९६)

Rasa : *Madhura*
Guṇa : *Śīta, Laghu, Snigdha*
Vīrya : *Śīta*
Vipāka : *Madhura*
Effect on Doṣa : *Pittahara, Kapha pittahara*
Karma : *Bṛmhaṇa Vṛṣya, Balya, Āyuṣya, Medhya, Vīryaprada, Puṣṭikara, Cakṣuṣya, Dīpana , Dāha, Kāntiprada.*

Therapeutic Uses

Mukta bhasma has been indicated in *Rājayakṣma, Kṣata, Kṣaya, Kāsa, Śwāsa, Dāha, Jwara, Santāpa, Agnimāndya, Prameha, unmāde, Driṣṭiroga and Virya Kṣaya.*

Dose : 1/4-1 Ratti

Anupāna : Madhu and Navnita

Formulations

Muktādi Cūrṇa, Indrokta Rasāyana, Hema Garbha Poṭṭali Rasa, Kumudeswara Rasa, Amara Kalanidhi Rasa, Kandarpa Sundara Rasa, Vasanta Kusumakara, Mṛganka Poṭṭali Rasa

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SUKTI

Pearl- oysters are the source of pearls and possess Straight long hinge uniting the two values. The lower valve being a little deeper than the upper. The surface of the shell is coarse and irregular and ruffled. The internal surface of the valves is of brilliant lusture, which is unrivalled by that of any other shell and raises their commercial value. The arrangement of internal organs in peral- oyster is the same in the edible oyster, except that a much reduced foot is found in the former, but not in the latter. Peral-oysters secrets perals when any organism enter the shell and cause irritation. Pelecypoda is the second longest class of Molluscus and Includes cockles, oysters, mussels and clams. Oysters are bivalved (Two-shelled) soft- bodied Molluscus. Many other marine bivalved, including peral- oyster and Windowpane Oysters are also popularly called oysters. The shell is composed of two valves hinged on the back by an elastic ligament, on account of which they are popularly known as Bivalves. The shell is hard, externally grey or dark – brown and rough, marked with lateral undulated streaks and internally white, smooth and shining.

Śānskṛt	:	Sukti
English Name	:	Pearl- oysters, Comon Oyster Shell
Hindi	:	Sukti
Chemical Constituents	:	Mainly Contains Carbonate.
Phylum	:	Mollusca
Class	:	Pelecypoda
Order	:	Pseudolamellibranchiata

Availability

The range of distribution of pearl- oysters extend from the Indian ocean to the central pacific and has been recorded from Bombay and the Andamans in the Indian Territory. Edible oysters are abundant in Madras, Kerala, Orissa, Dwaraka, Bombay, Ratnagiri and their vivinities along west coast and in the deltaic area of the Ganges in the West Bengal.

Varieties

Sukti is of two types:

1. *Muktā Sukti*
2. *Jala Sukti*

On two basis of synonyms, *Mukta Sukti* can be described as the source of pearl. *Jala Sukti* appears to be small and it is not described as the source of pearl.

Pearl- oysters belong to single genus, *Pinctada*. Five distinct species are found in Indian waters. Those species, viz.

(A) Pinctada Vulgari (B) Pinctada Margaritifer
(C) Pinctada Chemnitzi (D) Pinctada Anomioides
(E) Pinctada Atropurpurea

On the basis of size and shape these can be divided into 3 types

(A) Small Sized (B) Large Sized
(C) Flat Shaped

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Edible oysters

Edible *oysters,* originally included under Ostreidae. Mainly or the basis of shekll characters of adults, have subsequently been reclassified into three genera, viz.

(A) Ostrea Linn (B) Crassostrea Sacco

(C) *Pycnodonta* Sower by

Of these genus Crassostrea is common in India. The important species of edible oysters occurring in Indian waters are:

(A) Crassostrea Madrasensis, the Back water Oyser.

(B) Crassostrea Gryphoides,the Gaint oyster.

(C) Crassostrea cucullata, the Rock oyster.

(D) Crassostrea Discoidea, the disc oyster.

Depend upon the source, these can be divide in three types.

(A) Water Tank Based

(B) River Based

(C) Sea Based

Water tank based varieties are smaller than rive based varieties. River based varieties are smaller than sea based varietes and bigger than water tank based varieties. Sea based varieties are larger than above two varieties.

Śodhana

अम्लेन केनचिद्वापि दोलायन्त्रेण यत्नतः। शुक्तिकां पाचयेद्धीमान् शुद्धिमायात्यनुत्तमाम् ।।

(रसतरं. १२/६६)

Sukti will be subjected for *śwedana* in *Āmla Dravya or Jayanti Swarasa* in *dolā yantra,* then it will be purified.

Māraṇa

शुक्तिकां खण्डशः कृत्वा सम्पुटस्थां ततः पुटेत् । हिमकुन्देन्दुसङ्काशां शुक्तेभूर्तिं समाहरेत् ।।

(रसतरं. १२/६७)

अंगाराग्नैं स्थिनारधमाता सम्यक् प्रोत्फुल्लिता यदा । स्वांग शीतामृता, तां तुशिष्ट्वा सम्यक् प्रयोजयेत् ।।

(म तिः प्रोक्ता कपर्दवत्) (आयुर्वेद प्रकाशः २/३३०)

Ingredients

1. *Mūktaśukṭi*
2. *Kumāri swarasa*

Method : The purified *Mūktaśukṭi* is made into powder form and *cakrikas* are made and dried by giving *bhavana Ghṛt Kumāri swarasa* after that *Gajpuṭa* is given. Like this after completing two *Gajpuṭa* fine *bhasma* will be prepared. (It is also mentioned that *Maraṇa* should be done like that of *Varāṭika.*

Pharmacological Properties

Rasa	:	*Madhura*
Guṇa	:	*Snigdha*

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Vīrya	:	*Śīta*
Vipāka	:	*Madhura*
Effect on Doṣa	:	*Pitta Rakta Nāśini*
Karma	:	*Dīpani, Pācani, Baladāyani*

Dose : 250-500 mg

Anupāna : *Madhu, Nimbu Swarasa, Ghṛta*

Therapeutic Uses

Udaraśūla, jwara, pitta jwara, raktaroga, gulma, viṣa doṣa, hṛdaya śūla, plīha roga.

Other Uses

Oyster shells are used in the manufacture of different fancy articles and also in the production of lime.

Formulations

Grahaṇi Śardula Rasa, Pravāla Pañcāmṛta Rasa, Mahā Gandhaka, Baḍavānala Rasa, Aṣṭāmṛta Bhasma, Viṣama Jwarāntaka Loha, Muktā Pañcāmṛta Rasa, Bahu Mūtragha Rasa.

GODANTI

Description about *Godanti* is not available in ayurvedic classics till 20th century. Sri Sadananda sarma was the first, to describe *Godanti* in *RasaTarangini*. He has described the acceptable qualities of *Godanti*. Along with this, he also described the *śodhana* and *māraṇa* processes and therapeutic indications of *Godanti bhasma*. *Śrī Ācārya Yadava Ji Trikamaji* has also described its qualities, *śodhana* process, *māraṇa* process and therapeutic indications of *Godanti bhasma* in *Rasāmṛta*.

Śānskṛt	:	Godanti
English Name	:	Gypsum
Hindi	:	Godanti

Synonyms

Godantika, Godanta, Godanta.

Acceptable Variety

पत्राचितं सुमसृणं शरदिन्दुसु निर्मलम्। दीप्तप्रभं तु गोदन्तं ग्राह्यमत्र प्रकीर्तितम्।।

(रसतरंगिणी, ११/२३८)

Godanti, which contain many thin layers, having lusture , and very clean like moon of *saradṛtu*, should be collected. *Godanti* sometimes referred as a variety of *Haritāla*. But *Godanti* is not a variety of *Haritāla*.

Śodhana

गोदन्तं निम्बुनीरेण द्रोणपुष्पीरसेन व । यामार्द्धेनैव सुस्विन्नं विशुध्यति न संशयः ।। (रसतरं० ११/२३९)

Sodhana Processes described in *Rasa Tarangiṇi* and *Rasāmṛta* are presented in summarised form as follows:

Showing the methods of Sodhana of Godanti.

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Name of drug used	Technique/ time	Reference
For *Godanti Śodhana*		
Nimbu Swarasa	Śwedana/1.5 hr	R.T. 11/239
Droṇi Puṣpa Swarasa	Śwedana /1.5 hr	R.T. 11/239
Hot water	*Prakśalaṇa*	R.A. 5 /Page 62

Māraṇa

शरावसम्पुटान्तःस्थं गोदन्तं सुविशोधितम् । म्रियते पुटितं भस्म जायते शशिसुन्दरम् ।। (रसतरं० ११/२४०)

शुद्धगोदन्तिजं चूर्णं कुमारीस्वरसैर्दिनम् । निम्बपत्ररसैर्वाऽपि मर्दितं कृतचक्रिकम् ।।
शुष्कं गजपुटे पक्वं श्वेतवर्ण प्रजायते ।। (रसामृतम् ६/६)

Ingredients : Suddha Godanti Powder

Bhāvānādrugs : Nimba Patra rasa/Droṇapuṣpi rasa/Kumari Swarasa

Method : Suddha Godanti Powder is taken and made into round *cakrikas* by giving Bhāvanā with above mentioned drugs and dried. Then kepting *Sarāvasampuṭa* and *Gajpuṭa* is given. After 3 *Puṭas*, *Śweta Varṇa bhasma* is produced.

Pharmacological Properties

गोदन्तभस्म शिशिरं शिरःशूलनिवारणम् । ज्वरे क्षये तथा कासे पाण्डुरोगे ह्युरःक्षते ।।
शस्यते बालशोषे च प्रदरे श्वेतवर्णके ।। (रसामृतम् ६/८)
गोदन्तं सुमृतं शीतं पित्तज्वरनिषूदनम् । जीर्णज्वरहरं बल्यं दीपनं श्वासकासनुत् ।। (रसतरं० ११/२४१)

Guṇa : Śīta

Karma : Balya, Dīpana

Therapeutic Uses

Agnimāndhya, Godanti bhasma has been indicated in *Pittajwara, Jirṇajwara, Śwāsa, Kāsa, Śweta Pradara, Pāṇḍu, Urahkṣata, Bala Roga and Śirah Śūla.*

Dose : 500mg

Anupāna : *Madhu,Tulśi Swarasa, Ghṛta, Sugar, Godugdha.*

Formulations

Kāsisa Godanti Bhasma, Kālagni Bhairava Rasa, Śankha Dravaka Rasa, Nirvedana Cūrṇa , Muktādi Vaṭi, Śuddha Satka Yoga.

Kukkutāṇḍa Twak

र.त.सा.सि.प्र. सं. १

Kukkuṭāṇda Twak is known since *Saṁhitā period.* In *Caraka Saṁhitā, kukkutāṇḍa twak* has been used as an ingredient in *Sukhavaṭi Varti* and *Dṛṣṭipradhāna Varti* to treat *Timira* and *Kāca* (eye disorders). *Suśruta* in his text, *Susśuta Saṁhitā*, has included *Kukkutāṇḍa Twak* in *Avasādana Dravya* and he and also used it for *Pratisāraṇa Karma* to treat *vraṇa*. In *Bhāva Prakāśa* the author has mentioned a few *yogas* containing *Kukkutāṇḍa Twak* for eye diseases. In *Rasāmṛtam Kukkutāṇḍa Twak* is mentioned for the purpose of *Vanga Māraṇa*.

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Śānskṛt : Kukkutāṇḍa Twak
Name : Hen Egg shell

Synonyms

Śweta Bhasma, Śwetāṇḍa Bhasma.

Śodhana

Only a few texts have mentioned the *śodhana* of *kukkuṭāṇḍa Twak.*

Method-1 : Kukkuṭāṇḍa Twak should be macerated in water, containing salt and *Navasādar* for 4-6 days. Later remove the membranous part from the *twak* and wash the *twak* with Luke warm water.

Method -2 : Kukkuṭāṇḍa Twak should be macerated in water containing sakt fir 12 hours. Leter the membraneous part should be removed carefully, washed with water and dried.

Māraṇa

A few text books have mentioned *Māraṇa* of *Kukkuṭāṇḍa Twak.*

1. *Kukkutāṇḍa Twak* (Cleaned Eggshell)
2. Cāngeri Swarasa
3. Hingula
4. Ghṛta kumāri swarasa

Method-1 : Eggshell (cleaned) is collected and made in to powder form and *Cakrika* are made with *cāngeri swarasa* then kept in *śarāva saṁpuṭa*, and then another *śarāva* is kept over that, *sandhi bandhana* is made. Cow dung cakes are used for *puṭa*. After *swānga śītala* soft white color *bhasma* can be obtained. In that condition material is again made *bhāvana* with *chāngeri swarasa* and *cakrikas* are made, these *cakrikas* are again supposed for *puṭa*, then white color soft *bhasma* will be produced. This *bhasma* is again mixed with *hingula* and it is triturated for 12 hours with *ghṛta kumari swarasa*, then made in to cakrikas and dried in sun light, and put in *gajaputa* like this every time *Hingula* is added, *cakrikas* are made to repeat total 4 *Puṭas*. If *Hingula* is added since starting in all *Putas*, then there will be a chance for getting the *Śyama Varna Bhasma.*

Method - 2 : Five tolas of sodhita *kukkutanda Twak* should be powdered and macerated with '*Changeri Swarasa*' in a *khalwa yantra*. Pellets of this material should made, dried and kept in crucible. Later covered this crucible with another same crucible and sealed. And give the heat (Puta) to the sealed crucible by using four Sera upala, After heating, allow it to self cooling. By this method white coloured *Kukkuṭāṇḍa Twak bhasma* can be prepared.

Method-3 : Sodhita Kukkuṭāṇḍa Twak should be powdered and triturated with *Nimba Swarasa, Arka Kṣīra or Kumāri swarasa* for one day. Later make the pellets and dry. Keep the pellets in crucible and covered with another same crucible then heat (Gaja Puta). By this method white coloured *Kukkuṭāṇḍa Twak bhasma* can be prepared.

Karma : Rasāyana, balya, Māmsavardhaka, Dīpana, Pācana, Vājikarana.

Dose : 125 mg to 500 mg

Anupāna : *Navanīta, Śīta, Malāyi, Kṣira, Āmalaki Rasa, Dādima Phalarasa* some Physicians advise along with *Cyavana Praśava lehya.*

Therapeutic uses

Hṛdaya roga, sukravikāra, prameha, kapha prakopa, vātavikara, swapnadoṣa, mastiṣka roga,

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sukra nirbalata, napumsakatva, raktapradara, śwetapradara, bahumūtrata, somaroga, raktapata, advised after delivery.

Formulations

Sukhavati Varti, Dṛsti Pradhana Varti, Muktadi Maha Añjanam

ŚANKHA

Gastropoda is the largest class of Mollusces containing 30,000- 40,00 species and includes snails, slugs, limpets, whelks etc. The most characteristic feature of class is the spirally coiled shell. These animals are having a head distinct bearing tentacles, eyes and mouth.Body is unsegmented, asymmetrical with a coiled shell. These are enclosed within a shell and visceral mass is spirally coiled exhibiting torsion The shell is very hard and dense calcareous structure. It is in oblong or conical form. The oblong form is bulged in the middle and tepering at each end. The upper portion is like corkscrew, twisted and tapering at the end. The upper surface is highly tuberculated, the under surface is shining, very brittle and translucent.

Śānskṛt	:	Śankha
English Name	:	Conch
Hindi	:	Śankh
Chemical Constituents	:	Carbonate of Calcium, Iron, Magnecium, Sulphate, Phosphate and Chloride.
Phylum	:	Moflusca
Class	:	Gastropoda
Sub-class	:	Opisthobranchia
Order	:	Pyramidellacea
Latin Name	:	Turbinella Pyrum

Varieties

The commonly available species in Indian coast are-

(A) Turbinella Rapa (B) Turbinella Pyrum

(C) Xanchus Pyrum

On the basis of size these can be divided into-

(A) Big Size conchs (B) Small size conchs

(A) Big size conchs

Approximately measure 8" to10" in length and 6"-7" in breadth and weight about 2-5 kg.

(B) small size conchs

Generally these are 4" in length and 2"-3" in breadth.

Constituents

Contains mainly carbonate of Calcium, Iron, Magnecium, Sulphate, Phosphate and Chloride.

Availability

Indian ocean coasts. The land forms are usually found on and under plants in the sea, the shallow waters of the littoral zone with abundant seaweeds form their favourite habitat.

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Śodhana

(*Rasataraṅgiṇī, Taraṅga* 12/10)

1. *Śaṅkha* 1 part
2. *Kāñjika* Q.S. (for *svedana*)

Method : Small pieces of *śaṅkha* are bundled in a piece of cloth. *Svedana* in *dolā yantra* with *kāñjika* is given for three hours. When cool, the *śaṅkha* pieces are washed with warm water.

Māraṇa

शुद्धशंखस्य खण्डानि शरावे स्थापयेत्सुधीः। शरावेण विद्यायाथ यत्नात्सन्धिं प्रलेपयेत्।।
आतपे त्वथ संशोष्य पुटेद् गजपुटे भिषक्। स्वतः शोतं समुदधृत्य खल्वे सच्चूर्णयेद्भिषक्।।
चूर्णितन्चाथ विज्ञाय सम्पुटस्थं ततः पुटेव। एवं पुटदव्येनैव शंखकों मृतिमाप्नुयात्।।
(रसतरंगिणी, तरंग १२; १७-१९)

Śuddha śaṅkha 1 part

Method *: Śodhita śaṅkha* is placed in *śarāva sampuṭa. Sandhi lepa* is done and dried, and *gajapuṭa* is given. This process is repeated twice.

Dose : 250 to 300 mg

Anupāna : *Nimbu Swarasa, Triphala Kwātha,*

Therapeutic Uses

Ajirṇa, Āgnimāndya, Grahaṇi, Āmalapitta, Pariṇamaśūla, Yakṛtplihavṛddhi, Viṣa.

Other Uses

Conch shells are extensively used in the manufacture of fancy goods and artware. The production of lime from these shells is an important industry in India.

PRAVĀLA

There are several references about *pravāla available* in *Śrī Madbhāghagvata, Mahābharata*, which was used for ornimental purpose. But the internal usage of *Prāvala* can be seen from *saṁhitā* period. In *Caraka Saṁhitā*, Pravāla is an ingredient in *Dwitīya Brahma Rasāyana* and *Indrokta Rasāyana*, used for long life and to enchance memory respectively. *Pravāla* has been indicated in *Dāha Jwara* to treat fever and burning sensation. *Pravāla* as an ingredient in *Kanaka Kṣīra Taila* and *Muktādi Cūrṇa* has been indicated in *Kuṣṭha, Kaṇḍu* and *Hikka, Swāsa, Kāsa* repectively. *Suśruta* in his text *Suśruta Saṁhitā*, has indicated *Pravāla* for eye disorders. According to *Suśruta, Pravāla* is an ingredient in *Tīkṣana Kṣāra. Vāgbhaṭṭa* has included *Pravāla* in *Kaṣāya Skandha* in his text *Aṣṭaṅga Hṛdaya. Śārngadhara* has sescribed *śodhana* of *Pravāla* in his text *Śārngadhara Saṁhitā. Pravāla* has been used as an ingredient in *Vasanta Kusumakara*, used for *Prameha. Pravāla* also is an ingredient in *Sannipāta Bhairava Rasa* and *Kandarpa Sundara Rasa*. Used for *Sannipāta* and *Vājikaraṇa* repectively. *Śrī Bhāva Miśra* in his text *Bhāva Prakaśa*, has included *Pravāla* in *Nava Ratna* group and he described the synonyms, *śodhana, māraṇa* and qualities of *Pravāla. Ācārya Somadeva* has also included *Pravāla* in *Nava Ratna Varga* and described the acceptable, non-acceptable qualities and therapeutic indication of *Pravāla bhasma*. He has also mentioned the five types of *Ratna Doṣa* i.e, *Grāsa, Trāsa, Bindu, Rekha, Jalagarbhata* and indicated *Kṣāra Varga* for *Pravāla śodhana*, in his text book *Rasendra Cūḍamaṇi. Yaśodhara Bhaṭṭa* also described the acceptable, non-acceptable qualities,

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śodhana, māraṇa and therapeutic indication of *Pravāla* in his text book *Rasa Prākaśa Sudhākara*. He has also described the process to prepare artificial *Pravāla*. *Vāgbhaṭṭa* in his text *Rasaratna Samuccaya* has described the acceptable, non- acceptable qualities and therapeutic indication of *Pravāla* and included in *Nava Ratna* group. The author has descrived a few yogas containing *Pravāla* for various disorers in his text *Rasendra Sāra Samgraha*. *Ācārya Mādhava* had described the qualities of superior and inferior varienties along with therapeutic indications of *Pravāla* in his text *Āyurveda Prakāśa*. *Ācārya Govinda Dāsa Sena* has mentioned a number of *Pravāla* containing *yogas* for various ailments in his text *Bhaiṣajya Ratnāvali*. *Śrī Sadānanda Śarma* in his text *Rasa Tarangiṇi* has described the synonyms, acceptable, non-acceptable qualities, *śodhana, māraṇa* and therapeutic indications of *Pravāla* elaborately.

Śānskṛt	:	*Pravāla*
English	:	Corals
Hindi	:	*Pravāl*

Synonyms

Pravālaka, Pravāla, Bhauma Ratna, Vidruma, Abdhijantu, Viseṣottha.

Pravāla is the favourate *Ratna* of *Mangala Graha* and may be used for wearing to please *Mangala Graha*.

Varieties

On the basis of colour ther are four varieties of *Pravāla* viz.

1. White 2. Crey
3. Black 4. Red

Out of these only red *Pravāla* is considered the best.

On the basis of shape, *Pravāla* is of two type :

1. *Pravāla Śākha*
2. *Pravāla Mūla*

Acceptable variety

पक्वबिम्वफलच्छायं वृत्तायतमवक्रकम् । स्निग्धमव्रणकं स्थूलं प्रवालं सप्तधा शुभम् ।। (र.र.स. ४/१७)
बालार्ककिरणारक्ता सागरसलिलोद्भवा लता याऽस्ति ।
न त्यजति निजरुचिं निकषे घृष्टाऽपि सा स्मृता जात्या ।। (आयु. प्र. ५/९१)
सेतौ सागरमध्ये या जायते वल्लरी शुभा ।।
विद्रुमाख्या सुरक्ता सा दुर्लभा दीप्तरूपिणी । पाषाणत्वं मजत्येषा पाकतः कठिना सती ।।
प्रवालनाम तद्रक्तं वर्णसौभाग्यकान्तिदम् । सिद्धं स्वच्छं स्निग्धरूपं वृतं कान्तं समं गुरु ।।
रङ्गगात्रं दृढं पिण्डं प्रवालं श्रेष्ठमुच्यते । पक्वबिम्बफलाभासं जपाकुसुमसन्निभम् ।।
शुकतुण्डसमच्छायं प्रवालमतिशोभनम् ।। (आ.क.क्रि. ८/२४-२७)
पाण्डुरं धूसरं रूक्षं सव्रणं कोटरान्वितम् । निर्भारं शुभ्रवर्णञ्च प्रवालं नेष्यतेऽशुभम् ।। (र.र.स. ४/१८)

Pravāla, which is red like ripe *Bimbiphala*, long roung, smooth, thick without holes and fissures should he accepted. *Pravāla*, which is whitish or grey coloured, rough, light, thin and contains holes and fissures should not be accepted.

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Śodhana

तण्डुलीयद्रवेणेह दोलायन्त्रे तु यामकम् । प्रवालकं परिस्विन्न शुद्धिमायात्यनुत्तमाम् ।। (रसतरं. २३/१३३)
सर्जिकाक्षारसंयुक्ते सलिले परिपाचितम् । यामैकेन प्रवालं तु शुद्धिमायात्यनुत्तमाम् ।। (रसतरं. २३/१३२)

Different methods of *Pravāla Śodhana*

Name of drug used for	*Technique/ Time*	*Reference*
Taṇḍuliya Jala	*Śwedana*/3 hrs	R.T. 23/133
Kṣāra Varga	*Śwedana*/3 hrs	Ra.Pr.Su. 7/54.Ra.Cu. 12/54
Sarjika Jala	*Śwedana* /3 hrs	R.T. 23/132
Jayanti Swarasa	*Śwedana*/3 hrs	Sa. S.-M.K. 11/87, R.T.23/131 Y.R. Page 131
Caulayi Swarasa	*Śwedana*/3 hrs	R.T. 23/132

Māraṇa

विशोधितं विद्रुमं तु श्लक्ष्णचूर्णं तु कारयेत् । कन्याम्भसाऽथ सम्पेष्य शोषयेत् कृतचक्रिकम् ।।
(रसतरं. २३/१३४)
सम्पुटस्थं ततः कृत्वा त्रिवारं पुटयेद्भिषक् । एवं पुटत्रयैर्भस्म जायते शशिसुन्दरम् ।। (रसतरं. २३/१३५)
पिष्टं वरीरसेनेह प्रवालं कृतचक्रिकम् । म्रियते पुटितं वह्नौ भस्म स्यात् सुमनोहरम् ।। (रसतरं. २३/१३८)

Different *Rasa* text have described different *Bhāvaṇa Dravyas*. All the processes described are as follows :

Ingredients

1. *Pravāla*
2. *Kumāri Swarasa*

Different methods of *Pravāla Māraṇa*.

Text	*Name of the drug Used for māraṇa*	*Yantra*	*No. of Puṭas*
Sārngadhara Sāṁhita	*Kumāri Swaras*	*Śarava Saṁpuṭa*	-
Rasendra Cūramaṇi	*Kumāri Swarasa*	*Śarava Saṁpuṭa*	2
Rasa Prākaśa Sūdhakara	*Kumāri Swarasa*	*Śarava Saṁpuṭa*	2
Rasa Taṛṅgīni	*Kumāri Swarasa*	*Śarava Saṁpuṭa*	3
Rasa Taṛṅgīni	*Godūgha*	*Śarava Saṁpuṭa*	3
Rasa Taṛṅgīni	*Jayanti Swarasa*	*Śarava Saṁpuṭa*	3
Rasa Taṛṅgīni	*Śatavari Swarasa*	*Śarava Saṁpuṭa*	3

Pharmacological Properties

क्षयपित्तास्त्रकासघ्नं दीपनं पाचनं लघु। विषभूतादिशमनं विद्रुमं नेत्ररोगनुत् ।। (र.र. समु. ४/१९)
विद्रुमं सुमृतं क्षारं मधुरं लघु शीतलम् । दीपनं पाचनं चैव दृष्टिरोगनिषुदनम् ।।
त्रिदोषशमनं बल्यं विशेषात्कफवातनुत् । क्षयकासहरञ्चैव रक्तपित्तप्रणाशनम् ।।

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स्वेदातिनिर्गमहरं रात्रिस्वेदहरं परम् । विषघ्नं भूतशमनं वीर्यवर्णविवर्धनम् ।।(रसतरं. २३/१३९-१४१)

Rasa	:	*Kaṣāya, Madhura, Āmla*
Guṇa	:	*Laghu, Snigdha, Śīta*
Vīrya	:	*Śīta*
Karma	:	*Dīpana, Pācaṇa, Balya, Puṣṭikara, Cakṣuya, Māngalya, Graha, Doṣahara*
Effect on Doṣa	:	*Pittahara, Kaphapittanut, Tridoṣaghna*

Dose : 250 mg.

Anupāna : *Tandulodaka, gokṣurakaṣāya, madhu, ikṣurasa, satāvari kaṣāya.*

Therapeutic uses

Śotha, Kṣayaja Kāsa, Praśveda, Hṛtkampa, Asthisoṣa, Mūtrakṛcchra, Mūtrasada, Raktapitta, Rajayakṣma, Dṛṣṭiroga, Bhutonmāda, mangalagraha doṣa.

Formulations

Dwitiya Brahma Rasāyana, Indrokta Rasāyana, Muktādi Cūrṇa, Vasanta Kusumākara, Sannipāta Bhairava Rasa, Kandārpa Sūndara Rasa, Kastūri Bhairava Ras, Vasanta Mālati Rasa, Pravāla Pancāmrta Rasa.

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Chapter 12

SIKATĀ VARGA

SIKATĀ

Silican stones, when taken through the streams of rivers convert into white sand particles on breaking and that is known as *Bālukā* (sand). White sand particles are pure where as yellow and red colour is due to mixture of iron etc. materials in the sand. White sand particles are pure, where as yellow and red colour of the sand is due to the mixture of iron. Sand is of two types one with fine particles and the other with coarse particles. *Bālukā* is mainly used in the process of *Kupipakva rasāyanas.*

Śānskṛt	:	*Sikatā, Bālukā*
English Name	:	Sand
Hindi	:	Bālu, Reta
Latine	:	Silica

Pharmacological Properties

Rasa	:	*Madura*
Vīrya	:	*Śīta*
Karma	:	*Lekhana*

Therapeutic Uses

Santāpa, Śrama, Vraṇa, Urahkṣata. Take white fine sand in one *prasṛta* (2 pala) quanitity. Mix oil, ghee, honey, animal fat and marrow (*majjā)* each in equal quantity, mix all well with a spatula and use as *avaleha* for licking. It is a well experienced compound for *raktaṣṭhīvana* (Haemoptysis) and *urakṣata.* It's dose is 3-6 gms with milk.

DUGDHAPĀṢĀṆA

Dugdhāpaṣaṇa is a white, smooth and soft stone.

Śānskṛt	:	*Dugdhapāṣāṇa*
English	:	Talc, Soft Stone
Hindi	:	Sangejarahat
Chemical Composition	:	Compound of Magnesium and Silica

Synonyms

Kṣīrakṣav, Kṣīri, Kṣīra*pāṣāṇa, Dugdhadṛṣad, Dugdhapāṣāṇa Dugdhśīla, Dugdha, Dugadhi, Dugadhopal, Vajrābh, Saudha, Gomeda Sannibha, Madhavi, Soudha, Dugdhaśma, Dīptika.*

Pharmacological Properties

दुग्धोपलस्तु मधुरस्त्वीषदुष्णो ज्वरापहः। पित्तप्रशमनः कामं त्वग्दाहाध्माननाशनः ।।
हृदामयहरो रुच्यः पित्तशूलविनाशनः। कासश्वासहरश्चैव समाख्यातो भिषग्वरैः ।। रसतरं ११/२३३
दुग्धपाषाणको ग्राही व्रणरोपणकारकः। शोणितस्थापनः शीतो दन्तरोगहरस्तया ।। रसामृतम् ६/५

Vīrya	*Śīta*
Karma	*Grāhi, Śoṇitastāpaka, Vraṇaropaka, Śoṇitāsthāpana.*

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Therapeutic Uses

Danta roga, atisāra, pravāhika, raktapitta and kuṣṭa. In *Sadyovraṇa* it is used for *sphrinkiling* to check the bleeding. In wounds 8 parts of *Dugdha pāṣāṇa cūrṇa,* 1 part of *Khūnakharābā* and 1/4th part of *Rasakarpūra* are mixed in 20 parts of *Siktha taila* to be used as ointment for healing and cleansing of wounds.

In mukha and danta rogas a tooth powder made by mixing 4 parts of *Dugdha pāṣāṇa,* 1 part of laghu *Elā,* 1 part of *Kevābacīnī,* 1 part of *Khadira satwa* and 2 parts of *Bākula* bark my be used. By using this tooth powder stomatitis and bleeding gums are cured. *Dugdhāpaṣaṇa* is to be given with curds to treat *atisāra* and *pravāhika*. Powder of *Dugdhāpaṣaṇa*, *Nagakeśara* and *khūnkharāba* are to be mixed and are taken in the management of bleeding disorders. External application of *Dugdhāpāṣāṇa* and *Yavakṣāra* pounded with water is useful in *Sidhma kuṣṭa*. 1 *Ratti* dose of *Dugdhapāṣāṇa* is to be administered with milk or water for controlling low fewer appearing in the evening hours. Intake of *Dugdhapāṣaṇa* mixed with *Maṇḍūra bhasma* relieves *Pāṇḍu*

KAUŚEYĀŚMA

Kauśeyāśma is a soft stone, which is yellowish or reddish white in colour just like the threads of Silk. It is a bad conductor of heat hence may be used for protection from fire. It is also a compound of magnesium silicate. In south India it is used for making tooth paste. It's *bhasma* is used for *pyrrhoea, prameha* and *pradara rogas.* The big sheets prepared by asbestos are having fire proof property. It is used in tooth powders also.

Śānskṛt	:	*Kauśeyāśma*
English Name	:	Asbestos
Hindi	:	Resmi patthar

Māraṇa

The powder of *Kauśeyāśma* is to be steeped with *kumāri swarasa* and make the paste into cakes. After drying they are subjected to heat by means of *gajapuṭa* for 6 to 8 times for obtaining whitish *bhasma.*

Piṣṭi : Pound the powder of *Kauśeyāśma* with *ketaki* or *gulabi arka* for about 2 to 4 days for preparing *Kauśeyāśma Piṣṭi.*

Pharmacological Properties

Vīrya	:	Śita
Karma	:	*Rakta Stambhaka.*

Therapeutic Uses

Śweta and Raktapradara, Raktapitta, unmāda, dantapūya and Prameha.

Dose : 240 to 480 mg.

NĀGAPĀṢĀṆA

It is compound of Silica and Magnesium. It is available in the mountains of China,Tibet, Nepal & Gadhwal. It is white, green and yellowish in colour. In unani medicine it is used mostly. According to this it is hot in first stage and *rūkṣa* (dry), produces happiness, gives stength to heart, brain and liver, proves ojovardhaka (increases vigour and vatality) and *viṣahara* (antitoxic). It may be used in the form of *piṣṭi* which is useful in palpitation, cardiac weakness and vomiting conditions.

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Śānskṛt : *Nāgapāṣāṇa, Nāgāśma*
English : Serpentine, Ophite
Hindi : Jaharmohara

Pharmacological Properties

Guṇa : *Uṣṇa, Rūkṣa.*
Karma : *Ojovardhaka, Viṣahara*

Dose : 240 to 960 mg.

Anupāna : *Gulabi arka, Ketaki arka, water*

Therapeutic Uses

Hṛdaya, Dourbalya, Chardi, Atisara, Viśūcika.

Raktapradara : Add jaharmohara *piṣṭi, pravāla piṣṭi, abhraka bhasma, guḍūchi sattwa, kasisa* and *godanti* to *Nāgapāṣāṇa Bhasma* and is to be given twice or thrice a day with honey in the management of *Rakta Pradara* and *Dourbalya.*

Śirovedha : Add *Jaharmohara piṣṭi* with *śoda* bicorb and *Gulkanda* and is to be taken for *Śirovedha* due to hypertension.

Formulations

Jaharmohara Rasāyanam, Jaharmohara Piṣṭi, Godantimiśraṇa, Balvaṭi, Muktadivaṭi

BADARĀŚMA

Ācārya Yadavji has mentioned it for the first time in his book namely *Rasāmṛta*. Where as it is being used by Unany physicians since 3rd/4th century A.D. It is in the size of big *badara* (*jujuba*) fruit or almound and obtained from the stones (about the size of 1/2 to 1 inch). It is also having a stalk like structure. It is brownish in colour externally and the inner part is greenish white. It can be pasted with water easily. It is improted from Arab countries to India and commonly used by unani physicians. It does not have any taste.

Śānskṛt : *Badarāśma, Aśmabhid*
English : Silicate of lime
Hindi : Bera patthar, Pattharver, Hajarat ber
Chemical Formula : Compound of Silica and Lime

Synonyms

Asmabhit, Badarāśma, Badari Pāṣāṇa.

Availability

It is available in Arab, Syria, Egypt, Iran and Iraq.

Śodhana

Badarāśma is purified, if it is heated and immersed in *mūlaka swarasa* for 7 times.

Māraṇa

Badarāśma powder is to be steeped in *mūlakaswarasa* and pounded till it becomes a smooth

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paste. The paste is made into cakes and dried. They are subjected to *Gajapuṭa* for 7 times to obtain whitish *bhashma*.

Piṣṭi

Its *piṣṭi* can be prepared by grinding it with rose water or *candana* water for 3 days. It can also be prepared with *kadali stambha* juice or raddish juice by grinding it for seven days.

Pharmacological Properties

Karma : *Pittaśāmaka, Vamana Nāśaka, Mūtrala.*

Dose : 500 to 1000 mg.

Anupāna : *Kadalimūla Swarasa, Honey, Milk*

Therapeutic Uses

Mūtrakṛchhra, Mūtrāghāta, Mūtraśmari, Mūtradāha, Upadaṁsa.

Unani physicians are prescribing the paste of *Badarāśma* (obtained by pounding with water) for *Mūtrakṛchra, Mūtrāghāta.*

VYOMĀŚMA

Vyomāśma is a hard stone of green colour and has a tinge of whiteness or yellowishness. It is available in the rocks of mountains or from the mines. It is a compound of Sodium, aluminium and silicon.In modern gemology two types of zades have been described as Zadite and Nephrite. Muslims are used to keep this stone in the amulets and wear round the neck for the protection of heart. It is also included in uparatna (Semiprecious stones) Group.

Śānskṛt	:	*Vyomāśma*
English	:	Zade, Nephrite
Hindi	:	*Sangeyasab*
Chemical Formula	:	NaAl $(SiO_3)2$

Synonyms

Harinmaṇi, Haritāśma, Piluka and Sangeyaśava, Yaśabśila, Vyomāśma, Yaśawa.

Availability

It is available at Loddhakh, Kasmir, Tibet, New Zealand, Turkey and Siberia.

Śodhana

Vyomāśma is purified, if the pieces are heated and immersed in rose water or *Arjuna Twak Kwāth* for 21 times.

Māraṇa

Pound purified *Vyomāśma* in *Arjuna Kwāth* or rose water for 2 days and make the paste into cakes. Then they are subjected to heat by means of *Gajapuṭa* for 10 –12 times. In this process whitish *bhasma* is obtained.

Piṣṭi

The powder of *Śuddha Vyomaśma* is triturated with Gulab Jal and *Piṣṭi* is prepared.

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Pharmacological Properties

Rasa - *Madhura*

Guṇa - *Rūkṣa*

Karma - *Hṛdya, Oja Vardhaka and Buddhi Vardhaka, Jaṭharāgni prabodhaka.*

Dose : 120 to 480 mg.

Anupāna : *Arjunaswarasa, Gulabjala, Navanita, miśri.*

Therapeutic Uses

Hṛdaya atispandana, Hṛdaya dourbalya, Śūla and Hypertension, Āmasaya Śūl, Pravāhika, Mūtradāha, Aśmari.

Hṛddrava : It is useful in *hṛddrava* when *Vyomāśma bhasma, Jaharmohara piṣṭi, Rasasindūra, Lavanaga cūrṇa* are given with butter and sugar.

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Chapter 13

LAVAṆA AND KṢĀRA

LAVAṆA

Lavaṇa is an essential element in the diet of not only humans but of animals and even of many plants. Human needs salt to live. When man developed agriculture, salt was added to supplement the vegetable and cereal diet and the quest for salt become a primary motivation in history.

Indian history recalls the prominent role of salt and salt making; *Āyurveda* mentions six *rasa* namely *Madhura* (sweet), *Āmla* (sour), *Lavaṇa* (salty), *Kaṭu* (chilly), *Tikta* (bitter) and *Kaṣāya* (astringent). *Ācāryas* have explained regarding *Pāñchabhautik* composition (five elemental constitution), the characters, their effects.

The *Pāñchabhautik* composition for *lavaṇa rasa* is : *Jala + Agni (Caraka)*

Pṛthvi+ Agni(Suśruta)

Bṛhatrayi (*Caraka, Suśruta* and *Vāgbhaṭā*) have described about *Lavaṇa* under the heading *skanda varga.*

Lavaṇa according to different texts

In the Medieval time for the medicinal purposes, people of various regions were using *lavaṇas* according to their local name. So the name of one *lavaṇa* was different in one region from another. *Suśruta* describes the following varieties of salts viz., (1) *Saindhava;* (2) *Sāmudra* (3) *Viṭ* (*Viḍ*) (4) *Sauvarcala* (5) *Romaka* (6) *Audbhid* (7) *Cullika* (8) *pānsuja* (*Uṣasuta*). The first five pass by the name of *Pañca lavaṇa* or the five saltes and are often used in combination. *Pañca lavaṇa* is a carminative, laxative, stomachic, tonic, given in colic, indigestion and enlargement of the liver and spleen. It is made up of *Saindhava, Sāmudra*, *Sāmbara*, *Saurcal*, and *Viḍa lavaṇa.* The other varieties *of* salts are rarely used *in medicine. Audbhid lavaṇa is a* name. applied to *Śora or salt-petre.*

A number of salts are described in various ancient texts and out of which, some are not available in present day, but *pañca lavaṇa* are used mainly in medicinal purposes. The names of five varieties of *lavaṇa* included in *Pañca lavaṇa* group, varies from text to text.

As we go through *Āyurvedic* texts we found different opinions regarding the contents of *Pañca lavaṇa* group refering. The order differs from one to another but they all recommended five varieties of *lavaṇas* that are included in *Pañca lavaṇa.*

सौवर्चलं सैन्धवं च विडमौद्भिदमेव च ।
सामुद्रेण सहैतानि पञ्च स्युर्लवणानि च । स्निग्धान्युष्णानि तीक्ष्णानि दीपनीयतमानि च ।।
आलेपनार्थे युज्यन्ते स्नेहस्वेदविधौ तथा । अधोभागोर्ध्वभागेषु निरुहेष्वनुवासने ।।
अभ्यञ्जने भोजनार्थे शिरसश्च विरेचने। शस्त्रकर्मणि वर्त्यर्थमञ्जनोत्सादनेषु च ।।
अजीर्णानाहयोर्वाते गुल्मे शूले तथोदरे ।च.सं.सू. ८८-९१

Sauvarcalā, saindhava, viḍa, audbhida alongwith *sāmudra* are the five salts. They are having qualites of *snigdha, uṣṇa, tīkṣaṇa, dīpana* useful for *ālepana, snehakarma, śwedanakarma, virecana, vamana, vasti, abhyangana, bhojana, nasya, śastrakarma, varti* and for treating the *ānāha, vāta, gulma, śūla* and *udara.*

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Following texts have accepted *Saindhava, Sauvarchala, Viḍa, Śamudra* and *Audbhida* as *Pañca lavaṇa.*

1. Caraka Saṁhita, 2. Aṣṭānga Hṛdaya, 3. Cakaradatta, 4. Gadanigraha, 5. Ānandakanda, 6. Rasendra Cintāmaṇi, 7. Navaparibhāṣa, 8. Sidhaprayoga latika, 9. Bhaiṣajya ratnāvali, 10. Vangasena samhitā, 11. Yogaratnakara, 12. Rasakāmadhenu.

Following are the texts which have described same four *lavaṇas* but *Audbhida* is replaced by *Romaka.*

1. Suśruta Saṁhitā, 2. Śārangadhara Saṁhitā, 3. Bhāvaprakāśa Nighaṇṭu, 4. Rasa Ratna Samuchchaya, 5. Gorakṣa Saṁhitā, 6. Rasendra sāra sangraha, 7. Vaidyaratna, 8. Rasendra purāṇa, 9. Rasajalanidhi, 10. Siddhabheṣaja maṇimāla,11. Rasa tarangiṇi.

In *Suśruta Saṁhitā* regarding qualities of *lavaṇas* is mentioned as follows :

सैन्धवसामुद्रविडसौवर्चलरोमकौद्भिदप्रभृतीनि लवणानि यथोत्तरमुष्णानि वातहराणि कफपित्तकराणि यथापूर्वं स्निग्धानि स्वादूनि सृष्टमूत्रपुरीषानि चेति ।। (सु.सं.सू. ४६/३१४)

Audbhida, Romaka,Sauvarchala,Viḍa, Sāmudra and *Saiṇḍava* are superior to each previous one, in terms of their *vāta* alleviating and *Snigdha, Madhura* etc. properties. So *Romaka* is superior to that of *Audbhida.* Thus the group of *Pañcalavaṇa* contains; *Saindhava, Sauvarchala , Viḍa, Sāmudra* and *Romaka.*

औद्भीदम् पांशुलवणं रोमकं वासुकं वासु । (धनवन्तरी निघण्टु)

रोमकामौद्भीदम् मुक्तं वासुकं वासु पांशुलवणंमुसराजं । (राज निघण्टु)

Romaka is synonym to *Audbhida.* The qualities of *Romaka* and *Audbhida* described in different texts are almost similar. After going through these references it can be concluded that *Audbhida* can be replaced by *Romaka.*

Rasa Hridaya Tantra states groop of six *lavaṇas* viz. *Sauvarcala, Saindhava, Chullika, Samudra, Romaka and Vida.* "*Vidam krutrimam*" and several procedures are described in text for the preparation of it .In the same way different procedures are described for manufacturing *Cullika lavana.* As both are artificial ones having some what similar qualities, *Chullika* can be included in *Vida lavana.* This inclusion will not disturb the group of *Panca lavanas* stated earlier.

According to *Rasarnava Panchalavana* includes: *Samudra, Saindhava , Cullika, Sauvarchala and Kacha. Cullika* can be included in *Vida lavana. Adhamalla* has written that *Kacha* is sub type of *Sauvarcala.* Hence *Kacha* can be included in *Sauvarchala.* Again this inclusion will not disturb the group of five *lavanas* stated earlier.

According to *Rasa Ratnakara Ruddhivadi Khanda Panchalavana* includes: *Samudra, Saindhava, Kacha, Chullika and Sauvarchala.* Here *Kacha* can be included in *Sauvarchala* and we have already mentioned that Chullika can be included in Vida. This is analogous to lavana Chatuska of *Sarangadhara*

According to *Rasendra Chudamani* and *Vaidya Chintamani, Panchalavana* includes: *Samudra, Sainmdava, Kacha, Vida and Sauvarchala.* Here *Kacha* can be included in Sauvarchala which is analogous to *lavana chatushka of Sarangadhara.*

Lavaṇa Pañcaka (Five Salts)

सौवर्चलं सैन्धवञ्च विडमौभ्दिदमेव च । सामुद्रेण सहैतानि पञ्चस्यूर्लवणानि च ।। (च. सू. १/१०)

सैन्धवञ्चाथ सामुद्रं विडं सौवर्चलं तथा। रोमकश्चेति विज्ञेयं बुधैर्लवणपञ्चकम्।। (र.त. २/३)

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Saiṇdhava lavaṇa (rock–salt), *sāmudra lavaṇa* (sea-salt), *viḍa lavaṇa* (black salt containing Ammonium chloride), *sauvarcala lavaṇa* (sonchal salt containing iron and sulphur), audbhida, these five taken together in equal quantity and are called *pañca lavaṇa*.

- These five salts are collectively known as *Pañcalavaṇa or Lavaṇa-pañcaka.*
- Among all *saindhava lavaṇa* is the best one.
- In general *lavaṇa* means *saindhava lavaṇa* only.
- In *Rasaratnasamuchchaya* six kinds of salts are mentioned by adding *chulika lavaṇa* to the above five.

Lavaṇ Traya (Three Salts)

सिन्धुजं रूचकं पाक्यमेतत्त्रिलवणं स्मृतम् ।। (रसतरं. २.४)

Saiṇdhava, sauvarcala and *viḍa lavaṇa*—these three salts taken together in equal quantity and are called *lavaṇa traya.*

SAINDHAVA LAVAṆA

Saindhava literally means produced in *Sindh*. The term is applied to rock salt, which is regarded as the best of salts.

Śanskṛt.	-	Saindhava.
English	-	Rock-salt; Sea salt; Bay salt; Sodium chlorate.
Hindi	-	Sendha Namak
Latin name	-	Sodichloridum

Synonyms

Saindhava, Sindhu, Sindhuttha, Nadeya, Vimala, Vara, Śiva, Śītaśiva, Śudha, Sindhuja, Śilātmaka, Manimantha, Dhauteya, Pattuttama, Śivātmaja, Pathya Sarasa.

Availability

Found in Nature in extensive beds mostly associated with clay and calcium sulphate. To obtain it, holes are dug into these rocks which soon become filled up with salt water; the water is evaporated and the salt is left ready for use.

Characters.-It is found in small white crystalline grains or transparent cubes. It is brownish white externally and white internally. It has a pure saline taste and burns with a yellow flame.

Physical properties

1. Appearance	Stony pieces
2. Colour	Whitish red
3. Consistency	Hard
4. Taste	Saltish

Chemical properties

1. Sodium Chloride NaCl	97.68%w/w
2. Sodium Bicarbonate $NaHCO_3$	0.07 % w/w
3. Insoluble matter	0.031 % w/w

Apart from these *Saindhava lavana* also contains in minor quantities Magnesium chloride, Calcim chloride and Calcium sulphate.

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Varieties

Two varieties 1. Red 2.White.

As it is mentioned above *Saindhava lavaṇa* is of two varieties, among them the white variety (*śweta*) is considered for medicinal usage. The source of the *Saindhava lavaṇa* is from under ground mines as well as banks of the rivers.

According to *Ayurveda* by the name of *lavaṇa, Saindhava lavaṇa* is advised. *Saindhava lavaṇa* is one of the ingredient in many number of *Ayurvedic dosage forms* which are used internally as well as externally.

Pharmacological Properties

Guṇa	:	Laghu, Snigdha, Śitala
Vīrya	:	Śīta
Karma	:	Agnidīpana

Therapeutic Uses

Cakṣuṣya, *Hṛdya*, *Vṛṣya*, *Rucya*, pacifies all three *dosas* and *Vibandhajit* (cures constipation). In small doses it is highly carminative, stomachic and digestive. It promotes the appetite and assists digestion and assimilation. In large doses it is cathartic; in still larger doses it is emetic. Rock salt possesses stronger purgative properties. It is given in dyspepsia and other abdominal disorders. To rouse digestion weakened by diarrahoea, rock-salt and *Yavakṣār* are given, in convalescence. When heated it is used to foment painful, swollen and such other parts. Rock salt with warm water is used as an emetic. *Baḍavānal cūrṇa* containing rock salt, long pepper, pippali, cubes, *chitrak,* ginger and myrobalans in equal parts mixed and made into a powder is used in anorexia, flatulence.

Dose : Dose is 5 to 15 grains two or three times a day with water. A medicinal salt called *Narekela lavaṇa* is highly recommended in *Cakradatta* as valuable for dyspepsia treatment

SAUVARCHALA LAVAṆA

It is "a dark coloured salt made by dissolving common salt in a solution of *sājimāṭi* (crude soda) and evaporating it; this salt contains chloride of sodium, sulphate of soda, caustic soda but no carbonate of soda". It is 'aromatic, digestive', purgative, demulcent, bilious and beneficial in *Śūla,* abdominal tumours, intestinal worms and dysentery.

Sanskṛt	-	*Sauvarchala lavaṇa*
Hindi	-	Sonchal; Kalanamak.
English	-	Sochal Salt, Black Salt
Latin	-	Unaqua Sodium Chloride

Synonyms

Ruchaka, Tilaka, Hṛdyagandhaka, Akṣya, Kṛṣṇalavaṇa, Ruchya, Kodravika Sugandhi, Saugandhika and Jarana.

Availability

Sauvarchal lavana will have black colour. At present day in market it is available by the name of *Kāla namak*. As per latest literature of *Āyurveda, Sauvarchal lavaṇ* is a substance which is prepared by mixing sea salt and *Sarjikakṣāra* etc. There are evidences also present for preparing *Sauvarchala*

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lavaṇ by adding different other materials. Many of times *Sauvarchal lavaṇa* contains Sodium chloride and not Sodium carbonate. The market sample of the *Kala namak* is possessing following physical and chemical characteristics.

Varieties

Two varieties 1. Having smell 2 Having no smell

Physical properties

1. Taste	Saltish
2. Appearance	Big masses
3. Colour	Blackish brown
4. Consistency	Hard

Chemical Properties

1. Sodium Chloride NaCl	97.82%w/w
2. Total Sulphide Na_2S	0.918%w/w
3. Iron Fe	0.030%w/w
4. In soluble matter	0.07 % w/w

By observing these features *Kāla namak* can be considered as *Sauvrchal lavana* which is having the similar properties as mentioned for the *Sauvarchal lavaṇa*.

Pharmacological Properties

Guṇa	*Laghu, Visada, Sūkṣma, Sasneha*
Vīrya	*Uṣṇa*
Karma	*Dīpana, Pācana* it alleviates *vāyu* but does not aggravate *pitta* in excess.

Therapeutic uses

Vibhandha, Anāha, Śūla and *Udgāra*.

VIḌA LAVAṆA

Śānskṛt	-	*Kṛṣna lavaṇa*; Sanchal
English	-	Black salt; Sanchal Salt.
Hindi	-	Padelon Kalanimak

Synonyms

Kanda, Krutaka, Kṣāra, Asura, Supakya, Dhūrta, Krutrimak, Vidgandha, Pakya ghaṭikalavaṇa, Draviḍa

Availability :

Vit lavaṇa, Viḍa or *Viḍam* is an artificially prepared salt in dark-red shining granules, in Upper India chiefly at Bhewani in Hissar Dist. It has a mild, saline and somewhat nauseous taste. The salt has a reddish-brown colour and consists mainly of Sodium Chloride with traces of sodium sulphate, alumina, magnesia, ferric oxide, and sulphide of iron. Most of the samples examined were found to evolve minute quantities of sulphuretted hydrogen when treated with an acid even when placed in the mouth, the taste of this gas was distinctly felt. It is very probable that when the saline mass is fused with the organic matter (T. Chebula), a portion of the sodium sulphate is reduced to sulphide, which

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by double decomposition converts the traces of iron salt present into the sulphide. The sulphide was detected both in the insoluble residue as (FeS) as well as in the aqueous extract.

First Method - 56 lbs. of sambar salt are mixed with 20 ounces of dried emblic myrobalans; 1/4 of these materials is put into a round earthen pot with a narrow mouth which is put in a fire-place made of clay, The fire-place has a hole at the bottom for introducing the fire-wood. After the fire has been lighted about an hour, and the materials in the pot appear to be heated, the rest of the material are added by degrees. The whole is then exposed to a strong red heat for about 6 hours. The fire is then allowed to die away and the pot to cool; which upon being broken is found to contain about 48 Ibs. of *Vitlavan.*

Second Method - Heat together in a large earthen pot 32 lbs. of common salt, 1 Ib, of the fruit of Terminalia chebula, and 1 Ib. Phyllanthus emblica, and 1 Ib of impure carbonate of soda, until by fusion of the salt the ingredients are well mixed; when the pot is removed from the fire and its contents allowed to cool and form a hard cellular mass.

Vitlavaṇa, besides possessing the properties of salts in general, is a carminative, aperient, tonic and stomachic and useful in enlarged spleen and liver, flatulence, colic. dyspepsia, indigestion, bowel complaints etc.

Rasa	:	*Lavaṇa*
Guṇa	:	Laghu, *Tīkṣṇa*, *rūkṣa*, vyavāyi and metabolized after it has pervaded all over the body.
Vīrya	:	*Uṣṇa*
Karma	:	*Dīpana*, *Ruchya*, eliminates *Kapha* and *Vāyu* Through upward and downward tract respectively.

Therapeutic uses

Viṣṭambhaśūla, Hṛdgaurava, Aruchi, Anāha and *Śūla*. According to some *Āyurvedic texts, Viḍa lavaṇa* is supposed to be prepared by mixing different substances. The market sample of the *Viḍa* namak is possessing following physical and chemical characteristics.

Physical properties

1. Appearance	Small pieces
2. Colour	Greyish white
3. Consistency	Hard

4. By dissolving in water, it is also found some quantities of insoluble matter.

Chemical properties

5. Sodium Chloride NaCl	93.77 % w/w
6. Sodium Sulphide Na_2S	0.121%w/w
7. Iron Fe	0.0089% w/w

By observing all these features the market sample of *Viḍa namak* can be considered as Vid lavana which is having the similar properties, as mentioned for the *Viḍa lavaṇa*.

Audbhid lavaṇa which enters in the composition of *'panch-lavana'*, is produced of itself from the earth. "The efflorescences thus produced consist of three groups; 1st: the neutral, which contain no carbonate of soda (these consist chiefly of sodium chloride and sulphate, and frequently magnesium sulphate); 2nd: the alkaline chlorides and sulphates, but no lime or magnesian salt; 3rd: the nitrous efflorescences". "This is a ready explanation of the conversion of mercury and other metals

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into their chlorides when they are 'heated in combination with the *audbida* and other salts. The magnesium sulphate would readily yield sulphuric acid, which with sodium chloride and nitre might be expected to produce aqua regia". It contains principally of sulphate of soda (sodium sulphate) with a little chloride of sodium, (sodium chloride). In addition, there are sometimes carbonate of soda and some magnesium sulphate. It is alkaline, bitter, pungent and nauseating. It is said to be so abundant in some parts of the Punjab as to render the soil quite barren. *Some physicians or rather writers substitute this article for sambar salt* in *the composition* of *pañca lavaṇa or the five salts.*

SĀMUDRA LAVAṆA

Śānskrit	-	*Lavaṇa; Sāmudra Lavaṇa; Dronilavaṇa.*
English	-	Sea salt, Common salt, Table salt, Muriate of Sodium; Muriate of Soda.
Hindi	-	Namak, Nun.
Latin name	-	Sodi muris

Synonyms

Samudraka, Samudra, Samudralavaṇa, Śiva, Vashira, Sagarottha Shishira, Lavaṇabdhija, Varishambhuta, Akshiva, Asura, Sāgaraja and Lavaṇadadhisambhava.

Availability

Samudra literally means produced from the sea, i.e., derived from the evaporation of sea-water. Sun-dried sea-salt is described as somewhat bitter and laxative. In other respects its properties resemble those of rock salt.

Pharmacological Properties

Rasa	*Lavaṇa*
Guṇa	*Snigdha, Rūkṣa, Nātisara, Guru and Avidahi*
Vipāka	*Madhura*
Vīrya	*Nāti Uṣṇa*
Karma	Dīpana, Bhedana, Alleviates *Vāyu*, Aggravates Kapha, Does not aggravate Pitta in excess.

Samudra lavaṇa comes from the sea. Depending upon the location of the sea, mild variation in the composition of *Samudra lavaṇa* (sea salt) takes place. Sea salt obtained from southern part of India produces best quality.

Physical properties

Salt occurs as transparent cubes or small brownish-white crystalline grains, odourless, of saline taste and neutral reaction, soluble in water, insoluble in alcohol and chloroform.

1. Appearance	Cubical crystals
2. Colour	Whitish gray
3. Consistency	Hard

Chemical properties

1. Sodium Chloride Nacl	91.,39% w/w
2. Sodium Sulphide Na2s	0.121% w.w

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A part from these Samudra lavan also contains in minor quantities Calcium sulphate, Magnesium sulphate,Magnesium chloride etc.By observing above-mentioned factors it can be revealed that, *Samudra lavana* is crude form of Sea salt.

Availability

Sodium chloride or salt found in nature forming 2.5 p.c. of the waters of the ocean. It is obtained by lixiviation of saline soil or by evaporation of brine springs or sea water. When obtained from sea-water it is known as *Samudra lavaṇa.*

Action

Antiseptic, antiperiodic, anthelmintic. Common salt is an ingredient of our body and keeps the globulin of the blood in solution. We are continually losing it through sweat, urine, tears etc., *and therefore-its want causes disease and even death.* It increases the secretion of the gastric juice and should therefore be taken with discretion by the dyspeptic. It should be taken with caution by stout persons, patients with dropsy and those suffering from excessive thirst and skin diseases. The salt of the sea water contains *a small proportion* of iodine, which renders it essential for the human being as a preventive of goitre and other glandular enlargements. Internally in small *doses* it increases the secretion of the salivary and gastric glands, sharpens appetite and promotes digestion of vegetable food. It excites thirst and thus assists absorption of liquid food. In a diluted form it enters the blood and dissolves albumins and globulins. In a concentrated form it is an irritant to the cut surfaces to the mucous membranes, muscles and nerves. It is also a rubefacient. It decreases the secretion of mucous; It is eliminated in the urine. In large doses *i.e.,* 2 to 4 drachms in solution; salt acts as an emetic, and in still larger doses it is a powerful purgative.

Therapeutic Uses

Being one of the constituents of the blood and of the body generally, it forms an important di-etetic agent.

ROMAKA LAVAṆA

As it is mentioned in the *Pañca lavaṇa* sequence, *Romaka, Audbida* etc. According to many of the texts, *Romaka lavaṇa* is the synonym of *audbid lavaṇa. Ācārya Cakrapāṇi* mentioned.

रोमकं रूमानदिभवम् सैकम्भरीदेवीस्थलोपलक्षितेदेश हस्माबोधम् साम्भरीलवणमित्युन्ये । (चक्रदत्त)

Ācārya Hemadri considered, *Romakasakambharideśoṭṭhamam.* Present day in the trade the *Romak lavaṇa* is available by the name of *Sāmbhar namak.*

Śānṣkṛt name	-	*Romaka lavaṇa*
English name	-	Sāmbhar salt
Hindi	-	Savaro mith, Sāmbhar namak
Bombay	-	Vadagru mitha
Marathi	-	Sāmbhar luna, mitha

Synonyms

Gadakhya, Roma lavaṇa, Roma, Sakambharibhava, Gadadi lavaṇa, Shubhra, pruthvija, gadadeśaja, Gadottha, Maharambha, vastaka and *Audbhida.*

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Availability

Romaka, also called *Sākambari, Sāmbharnuna* or *Goda lavaṇa;* is the salt produced from the *Sāmbar* Lake near Ajmer. It is obtained by the evaporation of salt water from the river in the shape of clear rhomboidal crystals like alum. It has a pungent taste and is laxative and diuretic, in addition to possessing the other properties of salts. It is said to be the best and purest of evaporated salts.

Physical properties

1. Appearance	Circular crystal form
2. Colour	Whitish gray
3. Consistency	Hard

Chemical properties

1. Sodium Chloride NaCl	97.11 % w/w
2. Sodium Sulphide Na_2S	0.060 % w/w
3. Sodium Bicarbonate $NaHCO_3$	0.049 % w.w
Taste	Saline

Pharmacological Properties

Guṇa	*Tiskṣna, Vyāvayi, Laghu, Abhiṣyandi and sukṣma*
Vipāka	*kaṭu*
Vīrya	*Uṣṇa*
Karma	*Bhedi, Mūtrala, Rocana, Dīpana, Vātaghna*

By observing all these factors *Sambhar lavaṇa* is having approximately similar pharmacological and therapeutic values of *Audbida lavaṇa*. Hence *Sambhar lavaṇa* can be considered in place of Audvid *lavaṇ* for preparing *Āyurvedic* dosage forms which contains *Pancalavaṇa.*

Five varieties of salts (panchalavaṇa) are very commonly used in the preparation of many numbers of Ayurvedic dosage forms and as a routine dietic regimen. *Chullika salt*, mentioned by *Suśruta* and some later writers, cannot be identified at present. The name *Chullika* is said to be derived from the circumstances of the salt assuming a hard, granular or nodular shape from boiling; so that it is a sort of boiled salt. *Suśruta* describes it as stomachic, digestive and laxative.

Pānsuja or *Uśasūta* literally means, salt manufactured from saline earth. Common salt, manufactured from earth impregnated with salt water, would come under this head. It is "demulcent, stimulant, stomachic, generative of digestive fire, laxative, bilious and productive of burning."

Kṣāra

The saline earths include:- (1) *Taṅkaṇkṣār* (Borax). (l) *Yavakṣāra.* (Potash Carbonate, impure); (2) *Navasāgara* (Ammonium Chloride); (3) *Pāpaḍkhar* (Pearl Ash); (4) *Sajikṣāra.* (Carbonate of soda); (5) *Śorakṣār* (Saltpetre).;

TAṄKAṆA

Ṭaṅkaṇa is known to Indians long back and refered in *Caraka* and *Suśruta samhitā* as well as in later *Rasaśāstra* texts. It is one of the many important *Kṣāras* described in those texts. As seen in the synonyms it was useful in the melting process of metals and minerals, acting as catalyst in melting operations. It was considered as a best *Kṣāra dravya*. It also used as antidote in 8th century. In *Āyurveda,*

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Taṅkaṇa is considered as an antidote for Aconite poison.

Śānskṛt	:	*Taṅkaṇa*
English	:	Borax
Hindi	:	Sohaga
Chemical Formula	:	$Na_2B_4O_7 10 H_2O$ (Sodium-Pyro-Borate)
Crystal structure	:	Monoclinic
Colour	:	White, some times with blue or gray tinge.
Streak	:	White
Lustre	:	Vitreous, sometimes dull
Solubility	:	Soluble in water
Hardness	:	2-2.5
Sp. Gr.	:	1.71

Synonyms

Kṣārarāj, kṣāraśreṣṭa, ṭaṇkaṇ, ṭankaṇkṣār, drāvak, rangad, rasakṣāra, rasaghna, lohadrāvi, lohaśodhan, śwetakṣāra, soubhāgya.

Availability

In Tibet, Nepal and Iran, *Ṭaṅkaṇaṣāra* is obtained in the form of crystals on the banks of saline lakes. The pieces of *Ṭaṅkaṇa* should be cleaned with cloth and fried in an Iron pan to remove their water of crystallisation and to make these light and puffed. So purified *Ṭaṅkaṇa* should be used for internal use and for external application it may be used in original form. If it is mixed with dust etc. impurites then it should be mixed with water and decanted next day. It should than be filtered and heated on fire and on being semisolid it should be dried in sunrays and be used. Borax is prepared by ores. Which are abundantly available at Kashmir. Boron is the main ore for borax. Boron is available in 3 forms.

(1) Borax - $Na_2 B_4 0_7 10H_2 0$
(2) Boric acid - $H_3 BO_3$
(3) Colemanite - $Ca_2B_6O_1, 5H_2O$

In market two types of *Taṅkaṇa* is available.

(1) Sonari suhaga

(2) Coukya suhaga

1. *Sonari suhaga : Śweta Varṇa, Lavaṇa Rasa*, perls like big crystal pieces, *dhātu drāvaka.*
2. *Coukya suhaga : Pītha Varṇa*, small pieces, without taste, used for medicinal purposes.

Śodhana

अशुद्धष्टङ्कणो वान्तिभ्रान्तिकारी प्रयोजितः । अतस्तं शोधयेदेव वह्नावुत्फुल्लितः शुचिः ।।

(आयु. प्रका. २/२४४)

सुचूर्णितं टङ्कणं तु खलु पञ्चपलोन्मितम् । समुज्जवलोदरे क्षुद्रकटाहे विन्यसेत्ततः ।।
चुल्लिकायां निधायाथ पचेद् दर्व्या प्रचालयन् । सुपुष्पितं नष्टनीरं शुद्धिमायाति टङ्कणम् ।। (रसतरं. १३/७८)

Taṅkaṇa should be powdered. This powder should be kept over a pan which was heated with

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mandāgni, then it is supposed to *tīvrāgni*. After sometime some sought of sound will come. Water content will be evoparated. Atlast white lighter substance is obtained and this is called *Śodhita Taṅkaṇa*. *Aśudha Taṅkaṇa sevena* produces *vamana* and *bhrānti*. *Taṅkaṇa Māraṇa* vidhi not mentioned in *śāstra*, it can be used for medicinal purposes after *śodhana*.

Pharmacological Properties

अश्मरीमतिसारं च निहन्यात्स्थावरं विषम् ।। (आ.क.क्रि. १/२५६)

टङ्कणोऽग्निकरो रूक्षः कफघ्नो वातपित्तकृत् ।। टङ्कणो वह्निकृत्स्वर्णरूप्ययोः शोधनः परः ।
विषदोषहरो हृद्यो वातश्लेष्मविकारनुत् ।। (आयु. प्र. २/२४५)

टङ्कणः कटुरुष्णश्च रूक्षस्तीक्ष्णश्च सारकः । कफविश्लेष्णो हृद्यो वातामयनिषूदनः ।।
कासश्वासहरः कामं स्थावरादिविषापहः । अग्निदीप्तिकरश्चापि भृशमाध्माननाशनः ।
पित्तकृच्च समाख्यातो मूढगर्भप्रवर्तकः ।। (रसतरं. १३/८१)

Rasa : *Kaṭu.*

Guṇa : *Rūkṣa, Tīkṣāṇa, Sāraka.*

Vīrya : *Uṣṇa*

Karma : *Vātakaphaghna, Pittakṛt, Hṛdya, Balya, Sthāvarādi viṣa nāśaka, Agnidīptikara, Strīpuṣpajanaṇa.*

Dose : 125 to 250 mg

Anupāna : *Madhu, Ghṛta,* According to disease specific *Swarasa* or *Kwātha* also used.

Therapeutic Uses

Mūḍhagarbha, Āgnikṛt, Ārtava Janak, Aśmari, Atisārahara, Kāsa, Śwāsa, Ādhmana, Vraṇa Nāśak.

Other uses

It can be used for making *śodhana* and *drāvaṇa* of *swarṇa, roupya* etc. and *Rasaśiddhikṛt, Pāradavikāranāśak* etc. According to modern view *Ṭaṅkaṇa* produces cold feeling and diuresis, induces menstruation, and uterine contractions, acts as antacid, *jīvāṇunāśaka* (Antimicrobial), local depressant and antiinflammatory. In delayed labour *Ṭaṅkaṇa* is used along with ergot. *Ṭaṅkaṇa* mixed with honey if applied in mouth cures stomatitis. It is also used as a mouth wash in stomatitis. In gonorrhoea and leucorhoea it is used for urethral wash (Uttara Vasti) and for this 5 grains of *Taṅkaṇa* are mixed in one ounce of water. In vaginal itching *(Yoni Kaṇḍu), Ṭaṅkaṇa drava* (Borex lotion) may be used for vaginal washing.

Formalations

Amṛtamanjari Ras, Amṛtaṇava Ras, Ardhanārīśwara Ras, Anandbhairav Ras, Udakamañjari Ras, Kanakasundar Ras, Gaganasundar Ras, Chintāmaṇi Ras, Jwaranāgmyūr Ras, Trailokya cintāmaṇi Ras, Navajwarobhānkuś Ras, Naśyabhairav Ras, Pañchavaktra Ras, Pratāpatapana Ras, Pratāpalankeśwara Ras, Mṛtyunjaya Ras, Sannipātabhairav Ras, Sarvāngasundara Ras, Siddhapraṇeśwara Ras

SARJIKA KṢĀRA

Srjikakṣāra is prepared from the plant known as *loṇā/lonā* in punjab and *Sindh*. It is also known as *lotā sajji*. The *Sarjikṣāra* which is obtained from the market should be purified by mixing it in

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water and decanting the water next day and filtering it 5-6 times with thick cloth and dried on fire. For medicinal purpose purified *Sarjikṣāra* should be used.

Śānskṛt	:	*Sarjika kṣāra*
English	:	Sodium Salts,Dhobi's earth
Hindi	:	*Sarji, Sajjīkhāra*
Chemical Formula	:	Crude carbonate of soda or sulphate, soda carbonate

Varieties

There are three varieties of Carbonate of *Soda*, each known by its peculiar characters. These are *Sajjikhar* or Barilla *Sajjikhar-naphul* or washing soda or soda crystals; *Bangada khara* or very impure carbonate of soda, which contains a large amount of silica.

Pharmacological Properties

Guṇa	:	*Uṣṇa, Tīkṣṇa, Laghu, Rūkṣa*
Vīrya	:	*Uṣṇa*
Karma	:	*Kledī, Paktā, Vidāraṇa, Dahana, Dīpana, Chedana.* Destroys *śukra, Kaphadoṣa, Vibandha* and possess the properties like a fire.

Therapeutic Uses

Arśa, Gulma, Plīharoga.

SŪRYA KṢĀRA

In *Rasendra cūḍāmaṇi* and *Rasa paddhati, śveta śilājatu* or *karpūra śilājatu* is described to be similar to *sūryakṣāra* as it is considered white, sandy in appearance and produces fire and good for urinary disorders.

Śānskṛt	:	*Sūryakṣāra, Karpūra śilājatu, Śveta Śilājatu*
English	:	Potassium Nitrate
Hindi	:	Sorā, kalami sorā

According to modern view potassium nitrate is white, shining and crystalline in appearance. It is alkaline in taste, produces cold feeling in mouth. If put on fire intensifies burning, hence it is used in fire works. *Karpūra śilājatu* is good for *mūtrakṛicchra aśmarī, prameha, kāmalā* and *pāṇḍuroga.* It is purified by mixing it with elā (Elattaria cardamomum Maton) water and then dried. It's *māraṇa* and *satvapātana* is not mentioned by scholars. According to Modern view *sūrya kṣāra* is diuretic, diphoretic, antipyretic, expectorant and anti inflammatory.

PĀPAḌA KṢĀRA

It is obtained from alkaline earth and also prepared artificially. It is used to prepare *Pāpaḍa*, hence it is known as *Pāpaḍa khāra*. That which is white, light and easily breakable is considered best.

Śānskṛt	:	*Parpaṭa Kṣāra*
Hindi	:	Pāpaḍakhāra

Therapeutic Uses

Vātānulomana, Mūtrala, Sāraka, Antacid, Liquifier, Produces all the *Kṣāra karmas*. It cures *kāmalā* when used with butter milk after frying. It is mixed with *Jīraka, Śuṇṭhī* powder and water

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relieves *Ādhmāna* and *udara śūla*. *Pāpaḍa khāra* mixed with lime in equal parts removes *arśas* on external application and supress inflammation on local application.

YAVA KṢĀRA

Ripped barly (Hordeum vulgare Linn) plants should be cut, dried and then burnt to ashes and the alkaline material, obtained from that ash by *kṣāra vidhi*, is known as *Yavakṣāra*. For burning, either spikes or whole plant may be taken. *Yavakṣāra* is white and possess small granular powder form. It's taste is *kṣāra* and *tikta*. It contains mainly potassium chloride 50.8%, potassium sulphate 20.2%, potassium bicarbonate 12-6%, and Potassium Carbonate 6.8%, Thus, it is a mixture of potassium salts.

Śānskṛt	:	*Yavakṣāra, Yāvaśūka*
Engilsh	:	Potassium Salts
Hindi	:	Jaukhāra, Javākhāra

According to *Suśruta*, *Yavakṣāra* and *Sarjikṣāra* are considered to have similar properties. Both are considered to have *Uṣṇa Vīrya*. According to *Caraka, Yavakṣāra* destroys *Hṛdroga, Pāṇḍu roga, Grahaṇī roga, Plīha roga, Ānāha* and *Galagraha*. It may also destroys *Kaphaja rogas*, *Kāsa* and *Arśas*. According to *Suśruta* it destroys *śukra, vibandha, gulma, śleśmaja arśa* and *plīharoga*.

Pharmacological Properties

Rasa	:	*Kaṭu*
Guṇa	:	*Uṣṇa, snigdha and sara*
Vīrya	:	*Uṣṇa*
Karma	:	*Laghupāki, Sūkṣma, Dīpana, Sāraka, Mūtrala and Rasāyana*

Therapeutic Uses

Kaphajavyādhi, vātodara, āmaśūla, aśmarī, mūtrakṛicchra, viṣa doṣa, plīha roga, pāṇḍu roga, gulma, grahaṇī, arśas, ḥṛidroga, śūla, śwāsa, āmadoṣa, mūtrakṛicchra, mūtrāghāta, gulma roga and kapha vāta rogas.

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Chapter 14

MAYŪRA PANKHA

Peacock is a beautiful and national bird of India. Peacock fethars are available in most of the parts of India.

Śānskṛt	:	Mayūr
English Name	:	Peacock Fethar
Hindi	:	Mor

Synonyms

Mayūr, Candrakī, Śikhi, Mayūrpicch, Śikhaṇḍi, Megharāv, Kalāpi.

Pharmacological Properties

Rasa	-	*Tikta Kaṣāya*
Guṇa	-	*Laghu, Rūkṣa, Tikṣṇa*
Vīrya	-	*Uṣṇa*
Vipāka	-	*Kaṭū*
Karma	-	*Vāta Kapha haram, viṣa haram, grāhi.*

Māraṇa

Mayūra Pankha, Candrika Sahita are burned in an earthen pot with the help of *Ghṛtayukta Varti*, then material is grinded well and filtered in to fine powder form (some times it is fired in an Iron Pan).

Dose : 1 Ratti to 2 Ratti

हिक्कां हरति प्रबलां श्वासमतिप्रवृद्धं जयते । शिखिपुच्छ भस्म पिप्पली चूर्ण मधुमिश्रितं लीढम् ।।

(भै.र.हिक्का श्वासचिकित्सा-१२)

मयूरपक्षं निर्दह्य तद्भस्म मधुमिश्रितम् । लिढ्वा निवारयत्याशु च्छर्दि सोपद्रवामपि ।। (यो.र.छर्दिचिकित्स)

Anupāna : 1 Ratti of *Mayūra Pankha bhasma*, 1 *ratti* of *pippali cūrṇa* are taken then mixed with *madhu* and administered internally.

Therapeutic Uses

Hikka, Vamana, Śwāsa, Kāsa, Śītapitta.

BHŪNĀGA

The *satwa* obtained from *bhūnāga* is considered essential for melting hard substances like diamond. Further, it is considered as the best *tejas* (potentiating agent) for *pārada* (mercury) and *vajra* (diamond).

Śānskṛt	:	Bhūnāga
English	:	Earth Worms
Hindi	:	Kechua

Extraction of bhūnāga satva

First method- Grind the washings obtained from *bhūnāgas* (earthworms) with the extractive of *bhṛngarāja, nimbu* and *nirguṇḍī*, three days in each. It should then be ground with *drāvaka gaṇa*

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drugs and made into *vaṭakas* (round balls). Close them (the balls) in a stong crucible and blow strongly for two *daṇḍas* (48 minutes). After self cooling , place them over a flat stone and crush to fine powder. Collect the granules equal to *rājikā* in size and other small particles similar to sand having some weight. Grind well the remaining material and mix with one twelth part of arka (copper), blown again and wash carefully to collect the granules. By this material, the melting of substances like *vajra* may be done if desired. This is known as *khara satva*. It is the best *rasāyana*. It was observed that out of two or three crucibles the *satva* can definitely be obtained from at least one.

Second method – collect forty *prasthas* of *bhūnāga* from the soil containing metals like gold, silver, copper, magnetic iron etc. wash these with *haridra* water and cold water. Feed these to a young peacock or hen kept on fast. Collect their faecal matter, grind them well with *kṣāra* and *āmla* and dry them in intense sun heat. Then keep them (the dry powder) in a half earthen pot and heat to convert into *maśī* (black powder) form. Mix this black powder well with dravana varga drugs and grind well. Close it in a crucible and blow for two *drāvaṇa varga* drugs and grind well. Close it in a crucible and blow for two *ghaṭis* in a furnace. Collect the hard material from the cooled crucible and grind it . Now wash it and collect the fine granules carefully, blow these again like gold to make big granules.

Śrī Soma Deva has said that the *satva* (extract/ metal content) obtained from the *bhūnāgas* (earth-worms) is considered the best. One quarter part of this *satva* (extract) is added to two *śāṇas* (6 gm) of gold and mixed together, to make a ring. When applied locally, the water obtained after washing the ring acts as an antidote for all types of *Sthāvara* and *Jāṅgama viṣas*. This water also alleviates *netra ruk* (pain in eye/ eye diseases), *śūla* (abdominal pain), *mūlagada* (piles) and *karṇa ruk* (ear- ache) and relieves *prasūtigraha* (obstructed labour) also.

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Chapter 15

VIṢA

दृष्ट्वैतद्यद्विषीदन्ति जनास्तस्माद्विषं मतम् । नरं वा विषिणीत्येतन्मृत्युपाशैस्ततो विषम् ।। र.त. २४/१

विषं क्ष्वेडञ्च गरलं कालकूटञ्च तन्मतम् । र.त. २४/२

Viṣa is defined as that which gives misery to the human beings and others by mere its sight. It may cause death also. *Viṣa* is a substance which produces very harmful effect on mind and body is called as *Viṣa* (poison). *Viṣa* is having Synonyms like *Kśweda, Garala & Kālkūṭa*

खन्त्रौषधाश्रयं यत्तु विषं तत्स्थावराह्वयम् । सर्पादिजन्तुप्रभवं विषं जङ्गमसंज्ञकम् ।। र.त. २४/३

Varieties

Basing on the origin *Viṣa* is of 2 kinds : 1. *Sthavara* (Plant or Mineral origin) 2. *Jāngama* (Animal origin)

Mūlaviṣas are useful in treating *ūrdwabhāga doṣas*, where as *adhobhāga doṣas* will be treated by *Jāngama viṣas*. *Stāvara viṣas* are useful in treating the complications caused by *Jāngama viṣas* and vice versa.

कन्दः सारोऽथ निर्यासः पुष्पं मूलं फलं दलम् । त्वक् क्षीरं खनिरित्यस्य ह्यधिष्ठानानि वै दश ।।

र.त. २४/५

Basing on *adhiṣṭhana* it is of 10 kinds :

1. *Kanda* (Tubers)
2. *Sāra* (Wood)
3. *Niryāsa* (Exudations)
4. *Puṣpa* (Flower)
5. *Mūla* (Roots)
6. *Phāla* (Fruits)
7. *Dala* (Leaves)
8. *Twak* (Barks)
9. *Kṣīra* (Milky/latex)
10. *Khani* (Mines)

हालाहलः कालकूटः शृङ्गकश्च प्रदीपनः । सौराष्ट्रिको ब्रह्मपुत्रो हारिद्रः सक्तुकस्तथा ।।
वत्सनाभ इति ज्ञेया विषभेदा अमी नव । रसे रसायनादौ च वत्सनाभः प्रशस्यते ।।

र.त. २४/७-८

Sthavara Viṣa has been classified into 2 types such as :

1. *Mahaviṣa* (Eg. *Vastanābha* etc.)
2. *Upaviṣa* (Eg. *Tinduka* etc.)

Kālakūṭa, Vatsanābha, Śringaka, Pradipana, Halāhala, Brahmaputra, Haridra, Saktuka & Sourāṣṭrika etc. are the 9 drugs belongs to *Stāvar Mahaviṣas* and the 7 drugs belong to *Upaviṣas* such as– *Arka, Snuhi, Dhattūra, Lāngali, Karaviraka, Guñja, Ahiphena* etc. which are useful for mercurial operations.

Pounding of mercury with the above drugs attains the power of absorbing other metals in it.

लाङ्गली विषममुष्टिश्च करवीरं जया तथा । नीलकः कनकोऽर्कश्च वर्गो ह्यपविषात्मकः ।।

र.र.स. १०/८४

विषतिन्दूकबीजं च त्वहिफेनञ्च रेचकम् । धत्तूरबीजं विजंया गुञ्जा भल्लातकाह्वयः ।।

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अर्कक्षीरं सनुहीक्षीरं लाङ्गली करवीरकम्। समाख्यातो गणोऽयं तु बुधैरूपविषाभिधः।।

(र.त. २४/१६३-१६४)

In *Rasratnasamuchchaya*, the following drugs have been categorized under the group of *Upaviṣas* : *1. Langali, 2. Viṣamuṣṭi, 3. Karavira, 4. Jaya (Bhanga), 5. Nilaka (Bhallataka), 6. Dhattūra. 7. Arka.*

Pharmacological Properties

लघु रूक्षमाशु विशदं व्यवायि तीक्ष्णं विकासि सूक्ष्मं च। उष्णमनिर्देश्यरसं दशगुणयुक्तं विषं तज्ज्ञैः।।

(च.चि. २३/२४)

Viṣa is *Laghu, Rūkṣam, Āsukāri, Viśada, Vyavayi, Tikṣaṇa, Vikāsi, Sukśma, Uṣṇa*, Unexplainable tests etc. ten *Guṇas*.

Viṣākta Lakṣaṇa

1. Udwega	*2. Śarīra kampa*
3. Dāha	*4. Bhūpatana*
5. Phena vamana	*6. Angavaikalya*
7. Jaḍatwa	*8. Maraṇa*

Need of Śodhana

ये दुर्गुणा विषेऽशुद्धे ते स्युर्हीना विशोधिते। तस्माद्विषं प्रयोगेषु शोधितं योजयेद्भिषक्।।

(अ.प्र. ६/४७-४८)

विषं प्राणहरं प्रोक्तं व्यवायि च विकासि च। वातश्लेष्महृदाग्नेयं योगवाहि मदावहम्।।

तदेव युक्तयुक्तं तु प्राणदायि रसायनम्। पथ्याशिनां त्रिदोषघ्नं बृंहणं वीर्यवर्धनम्।। (आ.प्र. ५/४५-४६)

Before poisonous plants are therapeutically used, they are to be subjected to a process called as purification. This process reduces the toxicity of the poisonous plant product considerably and keeps it to required optimum level. If and when such purification processes are carried out the poisonous substances are attributed with certain properties. These are (1) *Rasāyana,* (2) *Yogawāhi,* (3) *Tridoṣaghna* (4) *Brimhaṇa,* (5) *Vīryavardhaka,* (6) *Prāṇadāyi.*

Collection of Poisonous Plants

The respective useful parts of the poisonous plants are to be collected when such plants are newly grown, and the useful parts are *'Guru'* in nature, solid in appearance. The parts must be of proved usefulness. There should not be plants having antidotes activity near by. The required parts should be unaffected by environment

Antidotes for Viṣa

The following is a list of substances which are used to treat symptoms arising out of long term use of over dose of poisons-

1. Borax
2. Turmeric
3. Juice of Meghanada
4. Sarpakshi
5. Putrajivaka

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6. Lemon juice
7. Powder of Terminalia arjuna
8. Vandhyakarkoṭaki
9. Trishulika
10. Gojihva
11. Ghee prepared from cow's milk
12. Goat milk

General instructions to the patient who is under treatment with poisons. The following substances, go better with the treatment and patients should be advised to restrict their diet to these substances :

1. Ghee
2. Milk
3. Sugar
4. Honey
5. Wheat
6. Rice
7. Black pepper
8. Rock salt
9. Black grapes (dried)
10. Sweet liquids
11. Cold liquids

Patients are also advised to be in cold climate, cool atmosphere.

VATSANĀBHA

दैर्घ्यं तु पञ्चाङ्गुलतः पर सप्ताङ्गुलोन्मितः । व्यासे चैकाङ्गुलात्सार्द्धद्व्यङ्गुलप्रमितस्तथा।
आमूलचूलं क्रमशः स्थलूञ्च पाण्डुरप्रभः। कन्दोअस्य भिषजां वर्यैर्वत्सनाभ इति स्मृतः।।
दीर्घमूलं स्थलूकन्दं वत्सनाभविषक्षुपम्। उत्पाट्य शीतसमये वसन्ते वा समाहरेत्।।

(र.त. २४/१२-१४)

Botanically, several plants are used a *vatsanābha.* Of these Aconitum ferox Wall is the most effective as medicine. It is the root of this plant which is used. Fresh root should be used in medicine. Old stack gets infested with insects and should not be used. In *Caraka Saṁhita* while narrating *Indri Rasāyana vatsanābha* is quoted. *Suśruta* quotes *vatsanābha* under the group of 13 kinds of *Kanda viṣas* in the chapter *Sthāvaraviṣa Vijñāniyam. Bhāvamiśra* described it's features as leaves resembling the shape of *nirguṇḍi*. Tuber is having the shape of the umbilical cord of a calf. No other plant grows in the surroundings of it. In *Rasaratnasamuchchaya* it is quoted that *vatsanābha* is pale white in colour. Currently Aconitum ferox wall is being considered as *vatsanābha*. Genus aconitum is consisting of many a number of poisonous and non poisonous species. Thakur Balvant Singh, while discussing about *vatsanabha*, proposed that Aconitum chasmantum is to be taken for *nābhi*.

Śānskṛt	:	*Vatsanābha*
English Name	:	Aconitum
Hindi	:	Vachhanabha

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Latin name : Aconitum ferox Wall.
Family : Ranunculaceae.
Chemical Compositon : Aconitin, Pseudo aconitin, Benzyl Aconin, and Homosepelin.

Synonyms

वत्सनाभो वत्सनागः क्ष्वेडोऽस्त्री च विषं मतम्। अमृतञ्च तदेवोक्तं रसतन्त्रविशारदैः।।
(र.त. २४/१६)

Kṣweḍa, Garala, Viṣa and *amṛta, Vatsanābha.*

Part used : Root

Adverse Effects of Impure Aconite

If used without appropriate purification, it causes burning sensation all over the body, fainting, cardiac arrest and even death.

Śodhana

विषं चणकसंस्थानं कृत्वा पोट्टलिकागतम्। सुरभीपयसा चेह दोलिकायन्त्रयोगतः।।
यामद्वयं वा यामैकं स्वेदयेदतियत्नतः। संशोधितं विषं त्वेवं विशुद्ध्यति न संशयः।।
खण्डीकृतो वत्सनाभः पोट्टलीगर्भसंस्थितः। अजादुग्धेन सुस्विन्नो यामतः शुद्धिमाप्नुयात्।।
(र.त. २४/२३-२४)

यथोक्तगुणसम्पन्नं वत्सनाभं समाहरेत्। ततश्चणकसंस्थानं खण्डशः कारयेद्भिषक्।।
पाषाणचषके वापि मृत्तिकाभाजने ततः। गोमूत्रेण समाप्लाव्य स्थापयेत्प्रखरातपे।।
प्रत्यहं पूर्वनिक्षिप्तं गोमूत्रमपनीय तु। दत्वा च नूतनं मूत्रं तीव्रधर्मे तु विन्यसेत्।।
एवं दिनत्रयं कृत्वा त्वचामपनयेत्ततः। शोषयेच्च विषं त्वेवं शुद्धिमायात्यनुत्तमाम्।।
(र.त. २४/१९-२२)

Take the root of aconite and cut into small pieces and keep them in a vessel containing *gomūtra*. Steep these pieces in *gomūtra* and expose to Sunlight for 3 days and *gomūtra* should be changed every day. On the 4th day remove the pieces and dry them in the bright sun light. In this process *vatsanābha* gets purified. The crude root contains about 1.4 % of total alkaloids, whereas the root trated with cows urine contains only 1.27%. Treatment with cow's urine and exposure to sun light will make partial change of toxic alkaloids Aconitin and Pseudo aconitin into the far less poisonous substances, Benzyl Aconin and Veratrolylacomine.

Pharmacological Properties

विषं तु कटुकं तिक्तमुष्णं चैव कषायकम्। योगवाहि परं चैतन्महोत्कृष्टं रसायनम्।।
त्रिदोषघ्नं विशेषेण मतं वातबलासनुत्। दीपनं शीतशमनं बृंहणं बलवर्द्धनम्।।
अग्निमान्द्यप्रशमनं प्लीहोदरनिबर्हणम्। वातरक्तापहं चैव श्वासकासविधूननम्।।
गुदामयग्रहणिकागुल्मनिर्दलनं परम्। कुष्ठपाण्डुज्वरहरं त्वामवातप्रणाशनम्।।
विनिहन्ति विशेषेण तिमिरं च निशान्धताम्। अभिष्यन्दं नेत्रशोथं कर्णशोथञ्च दारूणम्।।
कर्णशूलं शिरःशूलं गृध्रसी कटिवेदनाम्। आखुवृश्चिकसर्पाणां विषं चैवाविलम्बितम्।।
(र.त. २४/२६-३१)

Rasa *Madhura*

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Guṇa	*Laghu, rūkṣa, tikṣana, vyavayi and vikasi*
Vīrya	*Uṣna*
Vipāka	*Kaṭu*

Karma

Vātakaphahara, rasāyana, viṣahara, balya, grāhi and madakāri.

Therapeuti Uses

Kuṣṭa, madhumeha, agnimāndya, śwāsa, kāsa, sannipāta jwara, plihodara, apacī, śotha, Śirahśūla, Vṛscika Viṣa, Śūla.

यवाष्टकं भवेद्यावदभ्यस्तं तिलमात्रया। सर्वरोगहरं नृणां जायते शोधितं विषम्।।

(अ.प्र. ५/७१)

Dose : 7.5 mg to 15 mg twice daily.

Anupāna : Honey or milk

Testing

Before using aconite in medicine, the physician should ensure that the drug is absolutely free from toxicity. A small piece of this purified aconite should be placed over the tongue. It is free from toxicity, then there will be no tingling sensation and numbness of the tongue. It these sensations are observed, then the aconite should be processed with cow's urine again. It is rarely used alone. Generally, it is given in combination with other drugs in a compound from. Externally, it is used in the form of medicated oils.

Formulations

1. *Sanjīvanivaṭi*
2. *Kālakūṭa rasa*
3. *Sūcikabharaṇa rasa*
4. *Ānandabhairavi rasa*
5. *Tribhuvanakirti rasa*

Precautions

The patent using aconite should avoid heat producing food as well as drinks and alcohol. Borax and alum are antidotes of aconite poisoning. *Suśruta* explained the poisonous sympotoms of *vatsanābha* as *grivasthambha*, yellowish discoloration of stools, urine and eyes.

ARKA

It is a shrub which grows wild in the countryside all over India. There are two varieties : Calotropis gigantea (purple flowers) and Calotropis procera (white flowers). The leaves and stem when incised or crushed yield a whitish, milky, acrid juice.

Śānskṛt	:	Arka
English Name	:	Swallow Wort
Hindi	:	Madar
Latin Name	:	Calotropis gigantea
Chemical Composition	:	Both the varieties of the plants containing the similar types of alka loids and latex containing trypsin, calotropin, stem & root contains emylyn and gaigantial.

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Gaṇa : Bhedaniya, Vamanopaga, Swedopaga (Caraka); Adhobhāgahara, Arkadi (Suśruta)

Synonyms

Śwetarka : Sadāpuṣpa, Mandara, Alarka and Śweta puṣpa.

Raktārka : Arka varna, Śukla phala, vikiraṇa, Raktapuṣpa and Asphoṭa.

Varieties

According to *Dhanvantari Nighaṇṭu,* it is of two types:

1. Arka *2. Rājarka*

According to Bhāvaprākaśa

1. Śweta *2. Rakta*

Rājanighaṇṭu (4 types)

1. Arka *2. Rājārka*

3. Śuklārka *4. Śweta mandārka*

Modern Botanists described two types of *arka* as.

1. Calotropis gigantea (*śweta*)
2. Calotripis procera (Rakta)

ŚWETĀRKA

Latin Name : Calotropis gigantea

Family : Asclepiadaceae

Chemical Composition : Both the varieties of the plant containing the similar types of alka loids and latex contain Trypsin, Calotropin, Stem and root contains Emylyn and Gaigantial.

Śodhana

As the latex of *arka* and *snuhi* are naturally purified, there is no need of purification separately for them.

Pharmacological Properties

Rasa *Kaṭu, tikta*

Guṇa *Laghu, rūkṣa, tikṣṇa*

Vīrya *Uṣṇa*

Vipāka *Kaṭu*

Pharmacological Actions

Vātahara, dīpana recana, viṣahāra and *vṛśya* (flower)

Indications

Kuṣṭa, kaṇḍu, puriṣaja kṛmi, udara, plīhavṛddhi, arśa, śwāsa, kāsa and śotha.

Parts Used

Mūlatwak, kṣīra, puṣpa and patra.

Dose : *Mūlatwak cūrṇa* $^1/_2$ to1 gm. *puṣpa cūrṇa*-1 to 3 gm. and *kṣīra* $^1/_2$ to 1 gm.

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Therapeutic Uses

Pāma, Vicharchika, Śwāsa, Plīha vṛddhi, Kṛmidanta, Mukhakṣata, Arśa, Sarpa Viṣa, Mukha Kṛṣṇatwa, Kāsa.

Excessive intake of *arkakṣīra* causes vomitings and diarrohoea, polyurea and burning sensation in the tongue.

Treatment

Sugar mixed in the cold water is given for the management of above complications.

Formulations

Arkakṣīrādi bindu ghṛta, Arkāditaila, Arkādi gaṇa kwāth, Arkādi vaṭi, Arka lavaṇa

KARAVĪRA

Karavira tree grows upto 3 to 4 metres in height, The root and stem produces branches and sub branches and thus makes the tree thickly trellised one, The leaves are in threes, 10-15 cm. long, linear, lanceolate and tapering at the end. On scraping the leaves and bark, oozes latex. The flowers are white, red, yellow and blue in colour and fragrant. The fruit is round or oval in shape, 8 to 10 cm. long The legumes contain many seeds, which are light and dusky. The root skin and roots are used for medicinal purpose.

Sanskrit	:	Karavīra
English	:	Rose berry (Spurge)
Hindi	:	Kaner
Latin Name	:	Nerium indicum (Mill)
Family	:	Apocyanaceae
Chemical Composition	:	Root, bark, seeds & leaves of *Karavira* contains the alkaloids like Neriodorin, Neriozorin, Carabin, Scopolin, Oliandrin.

Synonyms

Hayamāra, Vajimara, Aśwamara, Aśwaghna, Aśwantaka, etc.

Śodhana

The roots are boiled in cows milk for three hours in *dola yantra*. Then they are washed with hot water, dried and ground before use.

Pharmacological Properties

Rasa	:	*Kaṭu, Tikta*
Guṇa	:	*Laghu, Rūkṣa, Tīkṣana*
Vīrya	:	*Uṣṇa*
Vipāka	:	*Kaṭu*
Karma	:	*Kaphavāta śāmaka, Kuṣṭaghna, Vraṇaropaṇa, Cakṣuṣya.*

Therapeutic Uses

Kuṣṭa, Kṛmi, Kaṇḍu, Aśmari, Upadaṁśa, Pālitya, Netrakopa, Indralupta, Duṣṭavrana.

Impure or in high doses, it causes cardiac depression, feeble pulse, cardiac arrest, respiratory arrest and then leads to death.

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Antidote

After stomach wash, cows ghee should be given.

Formulations

Karviradya taila, Karavira yoga, Hayamāradi taila etc.

SNUHI

Śānskṛt	:	Snuhi
English	:	Common Milk Hage
Hindi	:	Thuhara
Latin	:	Euphorbia nerifolia
Family	:	Euphorbiaceae.

Synonyms

Sudha, guḍa and Sehuṇḍa

Parts Used

Mūla, kanda, patra and kṣīra.

Pharmacological Properties

Rasa	*Kaṭu*
Guṇa	*Laghu, tīkṣṇa and snigdha*
Vīrya	*Uṣṇa*
Vipāka	*Kaṭu*
Karma	*Kaphavātahara, dīpana* and *recana,*

Dose : Mūla cūrṇa-1/2 to 1 gm. , swarasa- 5 to 10 mg. and kṣīra-1.25 to 2.5mg.

Therapeutic Uses

Gulma, udara, śūla, ādhmāna, śotha, arśa, kuṣṭa and *medoroga.*

Udara roga : Steep *pippali cūrṇa* with *snuhikṣīra* for 21 times and administer internally alongwith *madhura rasa āhara* to relieve *udara roga.*

Pādadāri : Take 1 *pala, snuhikṣīra* and prepare *taila* as per text by using *tilataila*. The oil, so prepared is used for the treatment of *pādadari* after mixing it with rocksalt.

Arśa : Add *haridra, koṣātaki, saindhava lavaṇa* and *gomūtra* to *snuhikṣīra* and apply externally to relive *arśa.*

Formulations

Sudha kandādi guṭika, Snuhikṣīra ghṛta, Vajra kṣāra, Snuhyādi taila.

LĀNGALI

Śānskṛt	:	Lāngali
English	:	Wolfs bane, Glory lilly
Hindi	:	Kalihāri
Latin	:	Gloriosa superba
Family	:	Liliaceae

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Snonyms

Kalihāri, Agniṣikha and Garbhanut.

Parts used : Kanda.

Śodhana

Lāngali is purified, in gomūtra for one day and then dried in the sunshine.

Pharmacological Properties

Rasa	:	*Kaṭu, tikta*
Guṇa	:	*Laghu, uṣṇa*
Vīrya	:	*Uṣṇa*
Vipāka	:	*Kaṭu*
Karma	:	*Kaphavātahara and garbhapātaka.*

Dose : Cūrṇa-250 to 500 mg. and 3 to 6 gms (for *garbhapātana*)

Therapeutic Uses

Kṛmi, kuṣṭa, arśas, śūla and vraṇa.

Formulations

Lāngalyādi guṭika, Lāngalyādi lepa, Lānglyādi Cūrṇa etc.

GUÑJA

Śānskṛt	:	Guñja
Hindi	:	Guñja
Latin Name	:	Abrus precatorius Linn.
Family	:	Fabaceae

Synonyms

Raktikā, raktā, tāmrikā, kṛṣṇa, cūḍikā, uccaṭā, śīta pākī, bhilla bhūṣaṇikā, aruṇā, cūḍāmaṇi, śikhaṇḍī, kṛṣṇalā, kākaṇantī and kāmbojī.

Parts used

Leaves, roots and seeds. Leaves and roots are non-toxic.

Types : It is of 2 types

1. *Śweta* and 2. *Rakta*

Adverse effects of impure Guñja

If used without appropriate purification, *guñja* causes vomiting and diarrohoea.

Śodhana

Guñja seeds should be crushed and tied in a piece of cloth in the form of a *poṭṭalī* (round bolus). It should be cooked in *dolā yantra* by adding cow's milk for three hours. Then these seeds should be washed with warm water and dried.

Pharmacological Properties

Rasa	:	*Tikta, kaṣāya*

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Guṇa : *Laghu, rūkṣa*
Vīrya : *Uṣṇa*
Vipāka : *Kaṭu*
Karma : *Kaphavātahara, vṛṣya, balya, keśya.*

Dose : 50 mg to 150 mg twice daily in empty stomach. If there is nausea or vomiting, then it can be used after food also.

Anupāna : Honey or milk.

Therapeutic Uses

Indralupta, kuṣṭa, kṛmi, kanḍu, śūla, mukha pāka, netraroga.

Formulations

Guñja bhadra rasa, Guñjādi taila

AHIPHENA

The shrub is 1 to 1.5 metres in height. The leaves are long and wide, alternately arranged with serrate margins. The flowers are red or black and white in colour. The fruit has the size of pomegranate fruit having different cells, small size, and it gets reptured on its own. This is called as 'doda'. The fruit shell is called as 'poshta'. Seeds are white or black in colour, unctuous and sweet. They are known as poppy seeds (poshta dana or khaskhas). The latex of this fruit is called as 'Aphoo'. The raw fruit is incised in the evening and on the next day, early in the morning, the latex is scratched and dried. This is morphine.

Śānskṛt	:	Ahiphena
English	:	Opium
Hindi	:	Aphim
Chemical Composition	:	Morphine, Codein, Narcotine, Nascopine, Papvarine, Apomorphine etc.
Latin Name	:	Papaver somniferum.
Family	:	Papavaraceae.

Synonyms

Apuka and Ahiphena

Parts Used

Phala niryāsa.

Śodhana

निर्मलं त्वहिफेनं तु शृङ्गवेरस्य वारिणा। विभावितं सप्तवारं शुद्धिमायात्यनुत्तमाम्।।

र.त. २४/२४२

Ahiphena is purified, if it is steeped with *śuṇṭhi swarasa* for 21 times.

Pharmacological Properties

Rasa : *Tikta, Kaṣāya*
Guṇa : *Laghu, Rūkṣa, Sūkṣma, Vyavāyi and Vikasi*
Vīrya : *Uṣṇa*

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Vipāka : *Kaṭu*

Karma : *Kaphahara, Vāta-Pittakara, Grāhi, madakāri, dhātu śoṣaka and śukra stambhaka.*

Dose : 60 to 125 mg.

Therapeutic Uses

Kāsa, atisāra, raktātisāra, jwara, śūla and dāruṇaka.

Toxicity

Śirobhāra, bhrama, ādhmāna, Kṛchhra śwāsa, oṣṭa-mukha-netra kriṣṇatwa, swedādhikhya, angaśaithilya, hastapāda śītata and āmavikara.

Treatment

Bṛhati phala swarasa is to be given with milk regularly in the management of above complications.

Formulations

Ahiphenāsava, Karpūra rasa, Nidrodaya vaṭi, Śaśiprabha vasti, Kṣīra vasti

DHATTŪRA

The plant is found everywhere in hotter parts of India, as a wed growing on heaps, in waste places, by road sides as well as in garden land. It is a shrubby succulent annual (occasionally growing 2 or 3 yrs) herb of 1 to $1^1/_2$ meter height. The plant is in flowering nearly throughout year but more number especially in the rainy season. Flowers are white and funnel shaped. Fruit is round and covered with soft prickles.

Śānskṛt	:	Dhattūra
English	:	Thorn apple
Hindi	:	Dhattur
Chemical Composition	:	Scopolamine, and minute quantities of Hyosciamine and Atropine, seeds contains fixed oil.
Latin Name	:	Datura metal Linn.
Family	:	Solanaceae

Synonyms

Dhattūra, kitava, unmatta, dhūrta, svarṇa, kanaka, śaṭha, kaṇṭaka phala and Śiva śekhara.

Parts used

The entire plant of *dhattūra* is used in medicine but its seeds are exceedingly potent as therapeutic agent, and these seeds should be used in medicine only after *soḍhana* (purification).

Adverse effects of impure Dhattūra

Dhattūra, if used without appropriate *śodhana,* may cause dryness, excessive thirst, cramps, nconsciousness and giddiness.

Śodhana

Seed of *dhattūra* should be cleaned of physical impurities and tied in a piece of cloth in the form of *poṭṭalī* (round bolus). It should be cooked in *dolā yantra* by adding cow's urine or cow's milk for three hours. Thereafter, these seeds should be washed with warm water and dried in the sun.

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Pharmacological Properties

धत्तूरः कटुकश्चोष्णस्तथा शोथनिषूदनः। कृमिघ्नः कुष्ठशमनो विशेषाज्ज्वरनाशनः।।
परं त्वग्दोषशमनस्तथा कण्डूतिकापहः। भ्रमकृन्मोहजननः समाख्यातो भिषग्वरैः।।

र.त. २४/३५०-५१

Rasa : *Tikta, Kaṭu*
Guṇa : *Laghu, Rūkṣa*
Vīrya : *Uṣṇa*
Vipāka : *Kaṭu*
Karma : *Kapha Vātaśāmaka, viṣaghna*

Dose : 25 gm to 50 mg. It is generally used in combination with other drugs in a compound form.

Anupāna : Cow's milk.

Therapeutic Uses

Kuṣṭa, kanḍū, jwara, vraṇa mūtra kṛchra.

Formulations

Kanakāsava, Sūtaśekhara rasa, Unmatta rasa, Dhattūra taila, Mahākanaka taila etc.

DANTI

Śānskṛt : Danti
Gaṇa : *Recana, Mūlini (Caraka), Śyāmadi, Adhobhāgahara (Suśruta)*
Latin : Baliospermum axillare Bluma.
Family : Euphorbiaceae
Chemical Composition : Roots contain starch and the seeds contain oil.

Synonyms

Danti, Nikumbha, Udumbaraparṇi, Eraṇḍaphala, Mukulaka.

Parts Used

Mūla, bīja, patra.

Śodhana

Initially take the seeds of *danti* and remove the seed coat and radical from the cotyledons. Then steep them with the water mixed with buffalo dung, for 3 days, and wash with hot water. Afterwards take the seeds in a piece of cloth and make it as a bolus and grind it in a mortar. So, that some portion of the oils is being absorbed by the cloth piece, and the seeds become a paste. Then apply this paste to the inner surface of new earthenware and keep it aside for one day. In this process, the remaining portion of the oil is being completely absorbed and the paste falls down inside the pot. Afterwards collect the material from the pot and pound it in a mortar by adding *jambīra swarasa* for number of times, then *danti* seeds, gets purifyied.

Pharmacological Properties

Rasa : *Kaṭu*
Guṇa : *Tikṣṇa*

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Vīrya : *Uṣṇa*
Vipāka : *Kaṭu*
Karma : *Kaphavātahara, dīpana, recana*

Dose : Mūla cūrṇa 1-3 gms. And bija cūrṇa 125 to 350 mg.

Therapeutic Uses

Arśa, Śūla, Kuṣṭa, Kaṇḍu, Aśmari, Śotha, Udara, Kṛmi, Kāmala.

Toxicity

Śūla, Atisāra, Hrillasa.

Treatment

Sweet and unctuous substances are to be given along with milk in the management of above complications.

Formulations

Dantyāriṣṭa, Danti haritaki, Brihatdanti ghṛta, Ichchhabhedi rasa

BHALLĀTAKA

Śānskṛt	:	Bhallātaka
English Name	:	Marking nut
Hindi	:	Bhilava
Chemical Composition	:	The fuit oil ontains the alkoloids like bhilwanol and Semi carpol.
Gaṇas	:	Dīpaniya Bhedanīya, Kuṣṭaghna, Mūtrasangrahaṇa (Caraka); Nyagrodhadi, Mustadi (Suśruta).
Latin Name	:	Semicarpus Anacardium Linn
Family	:	Anacardiaceae.

Synonyms

Bhallāta, tapana, agni, vahni, dahana, vāyu sakhā, vātārī, vraṇakṛt, kṛmighna and aruṣkara.

Part used

Seed

Adverse effects of impure Bhallātaka

If used without proper *śodhana* (purification), *bhallātaka* causes blisters, glossitis, diarrhoea, menorrhagia, ulcers, oedema and burning sensation.

Śodhana

The seed of *bhallātaka* should be soaked in water and rubbed over a piece of brick till the outer coating is removed. With the help of a knife, its top portion should be removed. Then it should be washed with warm water. Thereafter these seeds should be tied in a piece of cloth in the form of *poṭṭalī* (round bolus) and cooked in *dolā yantra* by adding cow's milk for three hours. Thereafter, these seeds should again be washed with warm water and dried.

Pharmacological Properties

Rasa : *Kaṭu, Tikta, Kaṣāya*

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Guṇa : *Laghu, snigdha, tīkṣṇa*
Vīrya : *Uṣṇa*
Vipāka : *Madhura*
Karma : *Vāta kaphaharam, dīpanam, bhedanam, medya, rasāyana, vṛṣya, mūtrasangrāhaṇa.*

Dose : 125 mg to 500 mg

Anupāna : Milk, butter or ghee.

Therapeutic Uses

Arśa, grahaṇī, gulma, kṛmi, kuṣṭa, kaphajaroga.

Precautions

Some persons are very allergic to *bhallātaka*. They should not handle this drug during *śodhana* and such patients should never be given this drug. Before using *bhallātaka* or its preparation, the mouth should be smeared with ghee, and if during the treatment by *bhallātaka* there is itching in the anus or urethra, salivation, gingivitis or glossitis, then the therapy should be discontinued. Coconut is a good antidote. Its pulp and water can be used to counteract the toxic effects of *bhallātaka.*

Formulations

Amṛta Bhallātaki lehya, Bhallātaka ghṛtā, Cinca bhallātaka. Bhallātaka rasāyana, Bhallātakasava, Bhallātaka kṣirapaka, Bhallātaka Modaka, Sanjivani Vaṭi etc.

BHAṄGĀ

Śānskṛt	:	Bhaṅgā
English	:	Indian hemp
Hindi	:	Bhaṅg
Latin Name	:	Cannabis sativa Linn.

Synonyms

Bhaṅgā, bhaṅgī, mātulānī, mādinī, mātikā, matulī, vijayā, tandrā kāriṇī and bahu vādinī.

Parts used

Unpolinated inflorescence (*gāñjā*) and tender leaves including fruits (*bhāṅga*).

Adverse effects of impure Bhaṅgā

If taken without appropriate *śodhana* (purification), it causes delirium, giddiness and unconsciousness.

Śodhana

Bhaṅgā or *gāñja* should be soaked in water for 24 hours. Then it should be squeezed out and dried. There after, it should be fried in cow's ghee with fire and stored in a clean glass bottle.

Pharmacological Properties

Rasa	-	*Tikta*
Guṇa	-	*Laghu, tikṣṇa*
Vīrya	-	*Uṣṇa*
Vipāka	-	*Kaṭu*

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Prabhāva - *Mādaka*

Karma - *Vedanāsthāpana, vātasleṣmahara, pitta-vardhaka, dīpana, pācana, recana, grāhi, śoṇita stāpana, śukra stambhana.*

Therapeutic Uses

Arśa, śūla, ardhāvabhedaka, agnimāndhya, atisāra, pravāhika, grahaṇī, rakta srāva, swāsa, mūtrāghāta etc.

Dose : 250 mg to 500 mg.

Anupāna : Milk added with sugar.

Precautions

In case of any adverse effect, the patient should be given lemon juice or tamarind to eat which counter acts the intoxicating effect of *bhaṅgā.*

Formulations

Jātiphaladi cūrṇa, Madanodaya modaka, Trailokyavijaya vaṭi, etc.

JAYAPĀLA

This is an evergreen small tree. The leaves are 5 to 10 cm. long, slimmy, oblong with 3-5 veins. The flowers are unisexual, greenish yellow, in clusters. Fruits 2 to 5 cm. long, oval but triangular and seeds brown in colour. The seeds contain tiglinic acid, crotonic acid and croton oil. The chief ingredient of the oil is crotonic acid, which exerts the strong purgative action.

Sanskrit	:	Jayapāla
English	:	Croton
Hindi	:	Jamalgota
Latin	:	Croton tiglium Linn.
Family	:	Euphorbiaceae

Synonyms

Jepala, recaka, saraka, vibhedani and mala dravi.

Parts used

Seeds

Adverse effects of impure Croton Seed

Croton seed is a strong purgative. If used without appropriate purification, it might cause excessive purging leading to dehydration, cramps, burning sensation and excessive thirst.

Śodhana

Croton seed should be soaked in water for one night. Its outer coating should be removed. From inside the kernal, leaf like cotyledons should also be removed. Then these are to be tied in a piece of cloth in the form of *poṭṭali* (round bolus). It should then be cooked in *dola yantra* by adding cow's milk. Thereafter, these kernals should be removed from the *paṭṭali* washed with warm water and dried in the sun. To remove the residual oil, these kernals should be pressed through two blotting papers and stored in a dry and new earthen jar.

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Pharmacological Properties

जयपालो मतस्तिक्तो विरेचनकरः परम्। जलोदरप्रशमनो नवज्वरनिबर्हणः।।
कृमिहारी कुष्ठहरो वातश्लेष्मनिषूदनः। वान्तिकृत्पित्तजननो वृश्चिकादिविषप्रणुत्।।
र.त. २४/३१८-१९

Rasa - *Kaṭu*
Guṇa - *Guru, tīkṣṇa*
Vīrya - *Uṣṇa*
Vipāka - *Kaṭu*
Karma - *Kapha vātaharam, dīpanam, recanam*

Dose : 15 mg to 25 mg.

It is generaly used in combination with other drugs in a compound form.

Anupāna : Cold water.

Therapeutic Uses

Kuṣṭa, kanḍu, arśa, śūla, aśmarī, śotha, udara, kṛmi.

Precautions

If there is excessive purgation, to stop it, cold water should never be used. On the other hand, warm water will stop motions. Borax is an antidote of croton seed poisoning.

Formulaions

Ichhābhedi rasa, Jalodarāri rasa, Jwarāri rasa, Añjanābhairava rasa, Vṛṣchik viṣahara lepa etc.

VIṢA TINDUKA

The tree grows upto the height 12-16 metres. The leaves are glabrous, having slight odour. The flowers are small, greenish-white smelling like turmeric. The fruits are ovoid like guava, yellow when ripe, with a very hard shell. The fruit pulp is tender, white and very bitter. The seeds are 2-5 in each fruit, 2 cm in breadth and 0.5 mm in thickness. The seed is big, round like a button, convex on the outer side, soft and covered with striations. The seeds are used for medicinal purpose, after purification. fruit contains 1.25 to1.5% strychnine.

Sanskrit : Viṣatinduka
English : Nux vomica
Latin : Strychnos nux-vomica Linn
Family : Leguminaceae
Hindi : Kuchila

Synonyms

Kucelaka, kucela, kucilā, viṣa tindu, tindu, tinduka, kāraskara, ramya phala, kupāka, viṣa muṣṭkā and kāla kūṭa.

Part used

Seeds.

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Adverse Effects of Impure Nux-Vomica

Administration of nux-vomica without proper purification causes tetanic convulsions, muscular pain, excessive thirst and redness of skin.

Śodhana

विषतिन्दुकबीजानि विन्यसेद् गृहवारिणी। दिनत्रयं प्रयत्नेन त्वपनीय बहिस्त्वचम्।।
निदाघे चाथ संशोष्य चूर्णयेद्भिषजां वरः। एवं विशुद्धिमायाति सर्वथा विषतिन्दुकम्।।

र.त. २४/१७२

Seeds of nux-vomica should be tied in a piece of cloth and made to a *poṭṭalī*. It should be cooked in *dolā yantra* for three hours by adding cow's milk. Seeds should then be washed with warm water. The outer coating of these seeds be removed by scraping through a knife. Then, after drying in sun, these seed kernels should be cut into small pieces and fried in cow's ghee. Then a powder should be prepared of these pieces and kept in a glass bottle for medicinal use.

Pharmacological Properties

Rasa	-	*Kaṭu, tikta*
Guṇa	-	*Laghu*
Vīrya	-	*Uṣṇa*
Vipāka	-	*Kaṭū*
Karma	-	*Kapha vāta haram, viṣa haram, grāhi.*

Dose : 25 mg to 125 mg twice daily. It is generally used in combination with other drugs in a compound form.

Anupāna : Milk, ghee, butter

Therapeutic uses

Kuṣṭa, Kandu, arśa, vraṇa, vātaroga etc.

Precautions

While taking nux-vomica, the patient should avoid heat producing diet and drinks. He should use more of cow's milk, butter and ghee. Cow's ghee is an antidote of nux-vomica poisoning.

Formulations

Agnituṇḍi rasa, Navājīva rasa, Lakṣmivilaś rasa, Śulanirmūlaṇ rasa, Suptivātari rasa, Viṣatinduka vaṭi, Kupiluhingwādi vaṭi, Karaskarādi yoga etc.

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Chapter 16

ĀDHARABHŪTA SIDDHĀNTAS OF BHAIṢAJYA KALPANĀ

(Basic Principles of Āyurvedic Pharmaceutics)

Bhaiṣajya kalpanā ādhārabhūta siddhāntas can be considered as basic fundamentaql principles of *Auṣadha nirmāṇa*. By doing different pharmaceutical processes, raw drugs are converted into medicinal form (*kalpanā*). While making the *Auṣadha kalpanā* physician has to think about the following aspects:

1. *Anukta* and *viśeṣokta dravya grahaṇa*
2. *Paribhāṣa*
3. Form of *auṣadha kalpanā* (solid-*vaṭi*, semi solid-*avalehya*, liquid-*kaṣāya*, *pānaka* and external applications-*malahara kalpanās* etc.).
4. *Auṣadha Nāmakaraṇa* (Naming of a recipe)
5. *Rasa, Guṇa, vīrya, vipāka, Karma, and Prabhāva*
6. *Bhaiṣajya mārga* (Route of medicine administration)
7. *Mātra*
8. *Anupāna*
9. *Auṣadhasevana Kāla* (Time of medicine administration)
10. *Savīryata avadhi* (Stability period)

Anukta Dravya Grahaṇa (Unspecified Part, Time etc.)

कालेऽनुक्ते प्रभातं स्यादङ्गेऽगुनुक्ते जटा भवेत् ।।
भोगेऽनुक्ते तु साम्यं स्यात्पात्रोऽनुक्ते च मृन्मयम् । द्रवेऽनुक्ते जलं ग्राह्यं तैलेऽनुक्ते तिलोभ्दवम् ।।
एकमप्यौषधं योगे यस्मिन्यत्पुनरूच्यते । मानतो द्विगुणं कार्यं तद्द्रव्यं तत्त्वदर्शिभिः ।।
चूर्णस्नेहासवा लेहाः प्रायशश्चन्दनान्विताः । कषायलेपयोः प्रायो युज्यते रक्तचन्दनम् ।।
(शा. सं. प्र. ख. १.४७-५०)

When no time is specified (in the *śāstra* for taking medicine or collecting herbs), then it should be done during the *morning*.

When the part of a plant (to be used in a recipe) is not specified (in the text) then the *root* (of the plant) is to be used.

When the proportion (in which different ingredients of recipe are to be added) is not specified (in the text), then all the ingredients are to be taken in equal quantities.

When the kind of the *patra* (vessel) {which is to be used for cooking a medicinal portion} is not specified (in the text) then *mud-pot* is to be used.

If the liquid to be used is not specified, then *water* is to be used.

If variety of *taila* (oil) is not specified, then *Tila taila* (sesame oil) is to be taken.

If in a recipe the same ingredient is mentioned twice then this ingredient is to be used in double the quantity.

Use of Candana

Candana is of the two types, viz. *Śweta* (white) and *rakta* (red). If in a recipe of *cūrṇa* (powder) or *ghṛta* (medicated ghee) or *āsava* (alcoholic preparation) or *avalehya* (linctus) the type of *candana* is

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not specified, then *śweta* (white) variety of *candana* is to be used. If, however, the recipe is a *kaṣāya* (decoction) or *lepa* (ointment etc. for external use), then the *rakta* (red) vairiety of *candana* should be used.

If in a recipe, the part of the plant to be used is not specified, then the root of the herb is to be used.

If the post-prandial drink is not specified, then water should be used.

If in a recipe, the part of a well known plant to be used is not specified, then along with root, its bark, etc., may be used.

If it is a big tree with wood inside, then the bark of such a trees should be used in medicine.

If the ingredients has small root, then the entire herb is to be used in medicine.

If the recipe is to be used internally, then in the place of *kṛsna jīraka* (*black variety of jīraka*), *śveta jīraka* (*white variety of jīraka*) is to be used.

By the name of *Lavaṇa, saindhava lavaṇa* is to be taken.

By the name of *Dugdha, Gokṣīra* is supposed to be taken.

By the name of *Ghṛta, Goghṛta* is supposed to be taken.

By the name of *Mūtra, Gomūtra* is supposed to be taken.

Selection of Drugs

नवान्येव हि योज्याते द्रव्याण्टखिलकर्मसु । विना विड्गकृष्णाभ्यां गुडधान्याज्यमाक्षिकैः ।।

(शा. सं. प्र. ख. १.४४)

In general, drugs which are freshly collected should be used in recipes. The exceptions are *viḍaṅga* (*Embelia ribes*), *kṛṣṇā* (piper longum), *guḍa* (jaggery), *dhānya* (ceareals and pulses), *ājya* (ghee) when used after preservation for some time).

Drugs to be Used in Wet-Form

गुडूची कुटजो वासा कूष्माण्डश्च शतावरी । अश्वगन्धा सहचरी शतपुष्पा प्रसारिणी ।
प्रयोक्तव्या सदैवार्द्रा द्विगुणा पैव कारयेत् । (शा. सं. प्र. ख. १.४५-४६)

Guḍūci, kuṭaja, vāsa, kūṣmāṇḍa, śatāvari, aśvagandhā, sahacarī, satapuṣpa and *prasāriṇi* should always be, used in wet-form (green state) and their quantity should not be doubled.

General Rule

शुष्कं नवीनं योज्यं सकलकर्मसु । आर्द्रं च द्विगुणं युञ्ज्यादेष सर्वत्रा निश्चयः । (शा. सं. प्र. ख. १.४६-४७)

However, the general rule is to use a dry drug only when it is freshly collected and dried, and all wet (green) drugs are to be used in double the prescribed quantity in all recipes barring the exceptions described before.

Modification of Recipes

If in a recipe or groups of drugs, anm ingredient is found to be unsuitable for a disease, then such an ingredient should be discarded and the recipe for that disease should be prepared excluding such inappropriate ingredients. If, however, in a recipe, a drug appropriate for a disease is not included, then the wise physician may add that ingredient to the recipe.

According to Ācārya Suśruta

In the recipes described by me (*Suśruta*) only a few essential ingredients are included. This is

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done to avoid details. If a physician adds appropriate and similar durgs into these recipes, then no mistake is committed. A wise physician, acquainted with the differences in the nature of the time of administration and the variations in the states of diseases, can use all or half of ingredients or only those which are readily available found amongst the group of prescribed drug.

Viśeṣokta Dravya Grahaṇa

If *gaṇa* name only mentioned in a particular formulae, then we have to collect the respective drugs, in mentioned quantity. E.g. *Pancakola, triphalā, daśamūla* etc.

In the *Pancakola gaṇa* there are 5 dravyas respectively, *Pippalī, Pippalī mūla, cavya, citraka* and *Nāgara*. Without mentioning their names specifically we are supposed to collect them in 1 kola *pramāṇa* each. Hence this *gaṇa* is called *paṁcakola* according to *Viśeṣokta Rūpa*.

Because of the above mentioned reasons *Anukta* and *Viśeṣokta Dravya Grahaṇa* of *dravya saṁgrahaṇa* plays an important role in *Ādhāra Bhūta Siddhāntas* of *Bhaiṣajya Kalpanā*.

Form of auṣadha kalpanā (solid - vaṭi, semi solid - avalehya, liquid - kaṣāya, pānaka and external applications - malahara kalpanas etc.)

By doing *auṣadha kalpanā* we can overcome the *tikta, kaṣāya,* etc. taste, which are usualluy unaccepted by patients. Example : *Vāsapatra kalka, Vāsapatra swarasa*, is some what difficult to consume by the patient, where as same vāsa if it is processed in to *avalehya* form (*vāsāvalehya*) can be taken by the patients with high acceptance because of its palatability, same time stability period also will be increased for that particular drug product. Example : *Swarasa, Kalka* should be taken *Sadhyo sevana* (immediately after preparation). Where as avalehya preservation is one year.

For this purpose the physician should know about *Bhaiṣajya kalpanā adhārabhūtha siddhānthas.* By knowing these fundamental principles only the skill (related with *Āyurvedic Pharmaceutics*) of the physician increases.

While doing different *Kalpanās* or formulae, we have to follow certain different principles.

Such principles are called *Bhaiṣajya Kalpanā Ādhārabhūtha Siddhānthas.*

E.g. in *Jwara*, to decrease the *Pitta Prabhāva* or *dāha* like symptoms, we are suppose to administer *pravāla piṣṭi*. But whereas in *sannipāta jwara, pravāla bhasma* is indicated. Here *Bhasma* and *pisti* are selectively chosen in two different conditions because of their pharmacological effect, which is having slight variation because of their change in the method of manufacturing. The *Pisti* is considered as having more *pittahara* effect than *bhasma*.

One medicine is suppose to be given in the form of *Hima Kalpanā* in summer season (Grīṣmṛtu). But the same medicine in same condition if the season is *Śaradṛtu* (autumn) we have to give in the form of *Kwātha*.

In *Navajwara,* the medicine should not be given in the form of Kaṣāya (decoction) because *Kaṣāya Rasa* will make *doṣa stambhana* and does not make *Āmapācanam.* Hence *Uṣnajala* (Hot water) is indicated in such conditions. In *Pittajwara tikta rasa dravyas* are suppose to be given. If *Jwara* is associated with *atisāra* (loose motions) and *Vamana* (Vomting) to save the patient's *Agni* and *Grahaṇi* too, *Cūrṇa, Kalpanā* is indicated. In the case of *Raktapitta Maṇḍa Kalpanā* is indicated, as a dietic substance. If *jwara* is associated with *Agnimāndhya* (Constipation) the specific diet indicated is *lāja, peya* mixed with specific medicinal drugs like *śuṇṭhi* etc., if patient is having *dāha* and *tṛṣna* (thirst), then *kṣīrapāna* is indicated.

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Depending upon the above conditions *auṣadhas* can be given in any form, like *Swarasa, Kalka, Kaṣāya, cūrṇa, Lehya* etc. depending upon the necessity. This selection will be made by following *Yukti pramāṇa* by the physician. Similarly, the diets like *Peya, Yūṣa, Manḍa, Vilepi, Odhana* also can be selected according to the condition, but the physician. Hence all these fundamentals are called *Bhaṣisajya Kalpanā Ādhārabhūtha Siddhāntas.*

Naming a Recipe

A recipe consists of several drugs. The name of the drug appearing in the beginning of the recipe is used for naming the recipe. This rule not with standing some recipes which are named is generally followed differently.

Some compound preparations prescribed for the treatment of various ailments are provided with names. According to the method adopted, these names can be classified into the following categories :

1. Based on the name of the person who discovered the formula e.g. *Cyavana-prāśa* (*Cikitsā* 1:1:62:74).
2. Based on the name of the important drug used e.g. *Āmalakaghṛta* (*Cikitsā* 1:2:4-6)
3. Based on the name of the drug enumerated in the beginning of the formula e.g. *Harītakī-yoga*(*Cikitsā* 1:1-76)
4. Based on the therapeutic effect of the formula e.g. *Bṛmhaṇī guṭikā* (*Cikitsā* 2:1:2432)
5. Based on the dose of the formula e.g. *Tikta-ṣaṭpalaka ghṛta* (*Cikitsā* 7:140-143)
6. Based on the attributes of the drugs used in the formula (of above)
7. Based on the number and/or quantity of drugs used e.g. (1) Aṣṭaśatoriṣṭa (*Cikitsā* 12: 32-33) (2) *Kaṁsa-harītakī* (*Cikitsā* 12: 50 –52)
8. Based on the physical quality of the product. E.g. (1) *Piṇḍa taila* (*Cikitsā* 29:123) (2) *Pitaka curṇa* (*Cikitsā* 26:196-197)
9. Based on the similes on the effect of the drug e.g. *Gandhahastī-nāmāgada* (*Cikitsā* 23: 65-76)
10. Based on the method of preparation e.g. (1) Kṣārāgada (Cikitsa 23:95-105)
11. Based on the time of collection of the ingredients. E.g. Puṣyānuga-cūrṇa (*Cikitsā* 30:90-95)

Terms indicating the methods of preparation are usually suffixed to these names. Terms like *Mahān* and *kṣudra* indicating major or minor nature of the preparation are also prefixed to these names.

Importance of Rasa, Guṇa, Vīrya, Vipāka, Karma and Prabhava

द्रव्ये रसो गुणों वीर्य विपाकः शक्तिरेव च । पदार्थाः पातिठन्ति स्वयं स्वयं कुर्वन्ति कर्म च ।।
रसः स्वाद्वम्ललवणतिक्तोषणकषायकाः । षड्द्रव्यमाश्रितास्ते च यथापूर्वबलावहाः ।।
तत्राद्याः मारूतं घ्नन्तित्रायस्तिक्तादयः कफम् । कषायतिक्तामधुराः पित्तमन्ये तु कुर्वते ।।
ये रसाः वाताशमना भवन्ति यदि तेषु वै । रौक्ष्यलाघवशैत्यानि न ते हन्तुःसमीरणम् ।।
ये रसाः पित्तशमना भवन्ति यदि तेषु वै । तीक्ष्णोष्णलघुताश्चैव नैते तत्कार्मकारिणः ।।
ये रसाः श्लेष्मशमना भवन्ति यदि तेषु वै । स्नेहगौरवशैत्यानि न ते हन्युः कफं तदा ।।

(भा. प्र. मि. प्र. ६.१६९-१७४)

द्रव्ये रसो गुणों वीर्य विपाकःक्तिरेव च । पदार्थाः पातिठन्ति स्वयं स्वयं कुर्वन्ति कर्म च ।।
रसः स्वाद्वम्ललवणतिक्तोशणकशायकाः । शड्द्रव्यमाश्रितास्ते च यथापूर्वबलावहाः ।।

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तत्राद्याः मारूतं घ्नन्ति त्रयस्तिक्तादयः कफम् । कषायतिक्तामधुराः पित्तमन्ये तु कुर्वते ।।
ये रसाः वाताशमना भवन्ति यदि तेषु वै । रौक्ष्यलाघवशैत्यानि न ते हन्तुःसमीरणम् ।।
ये रसाः पित्तशमना भवन्ति यदि तेषु वै । तीक्ष्णोष्णलघुताशैव नैते तत्कार्मकारिणः ।।
ये रसाः श्लेष्मशमना भवन्ति यदि तेषु वै । स्नेहगौरवशैत्यानि न ते हन्युः कफं तदा ।।

(भा. प्र. मि. प्र. ६.१६९-१७४)

Eventhough drugs have got some active principles with which they work, they have some other fractions too. Which counteract their bad effects. If any. Therefore *Āyurveda* advocates that drug should be used as a whole so that the desired effects may be had without any side effects. *Āyurveda* propounds the principles of *rasa, guṇa, vīrya, vipāka, karma* and *prabhāva* and attributes the actions of a drug to any one of the *rasa-vipāka-guṇa-vīrya-probhāva.*

Generally, the body is nourished by *āhara* and the disease is treated by *auṣadha*. The dietetic and medicinal substances are composed of the *Pañcamahabhūtas* (five proto elements). The health or disease is known by certain normal and abnormal functions of the *doṣas* in the body. If the symptoms indicate the increase of a *doṣa,* we have to decrease it by giving substances having predominant *pañcabhaūtika* constitution similar to that of the decreased *doṣa*. The combination of the *pañcabhūtas* gives rise to six *rasas*.

Rasa

Definition

Rasa is the object of the gustatory sense-organ which is located in the tongue. But it is not only perception of taste but is an indicator of the composition, properties and probable action of the drug.

Apart from the above, in *Āyurveda* the word *rasa* denotes *pārada* (Mercury), *swarasa* (expressed) juice of a plant) and the *rasa* (first of the *dhātus*) in the body.

Number of Rasas

There are six rasas each composed of two *Mahabhutas,* such as :

1. *Madhūra* — Pṛthvi + Jala
2. *Āmla* — Pṛthvi + Tejas
3. *Lavaṇa* — Jala + Tejas
4. *Kaṭu* — Vāyu + Tejas
5. *Tikta* — Vāyu + Ākasa
6. *Kaṣāya* — Vāyu + Pṛthvi

Regarding composition of *āmla* and *lavaṇa rasa* there is difference of opinion between *Caraka* and *Suśruta*. The composition given above is as proposed by *Caraka*, while according to *Suśruta, āmla* is composed of *Jala + Tejas* and *lavaṇa* of *Pṛthvi + Tejas.*

Action of rasas

Actions of rasa may be studied on the level of dosas, dhatus, malas, agni and srotas.

Action on dhātus

Madhura, āmla and *lavaṇa rasas* increase *kapha* and decrease *vāta*, on the contrary, *kaṭu, tikta* and *kaṣāya* increase *vāta* and decrease *kapha.* The *agneya rasas* (*kaṭu, āmla* and *lavaṇa*) and *saumya*

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rasas (*madhura, tikta* and *kaṣāya*) increase and decrease and decrease *pitta* respectively.

Order of administration of rasas

A. In Medicine :

In treatment of diseases *rasas* should be used in a definite order according to dosa as follows :

Doṣa	I	II	III
Vāta	*Lavaṇa*	*Āmla*	*Madhura*
Pitta	*Tikta*	*Madhura*	*Kaṣāya*
Kapha	*Kaṭu*	*Tikta*	*Kaṣāya*

B. In diet :

I	II	III
Madhura	*Āmla-Lavaṇa*	*Kaṭu-Tikta-Kaṣāya*

In meals, one should start with *madhura* and finish with *kaṭu-tikta-kaṣāya*. In between *āmla* and *lavaṇa* should be taken. But if the food is excessively spicy, the meal should end with *madhura*.

Sl. No.	*Rasa*	*Properties*
1.	*Madhura*	*Snigdha, Śīta, Guru*
2.	*Madhura*	*Snigdha, Uṣna, Guru*
3.	*Lavaṇa*	*Snigdha, Uṣna, Guru*
4.	*Kaṭu*	*Rūkṣa, Uṣna, Laghu*
5.	*Tikta*	*Rūkṣa, Śīta, Laghu*
6.	*Kaṣāya*	*Rūkṣa, Sīta, Laghu*

Guṇa

Definition

Guṇa is that which is located in *dravya* inherently is causative agent and devoid of property and action.

It means that *guṇa* itself has no action but it qualifies the *dravya* for such action.

Number and classification

There are forty one *guṇas* in all which can be grouped into four categories.

1.	*Gurvādi* (Physico- Pharmacololgical)	20
2.	*Parādi* (Pharmacological	10
3.	*Visiṣṭa* (Specific)	05
4.	*Ādhyatmika* (Psychological)	06
	Total :	41

Gurvādi Guṇas

They are twenty in number and in ten pairs as follows :

1.	*Guru*	*Laghu*
2.	*Manda*	*Tikṣṇa*

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3. *Śīta*	*Uṣṇa*
4. *Snigdha*	*Rūkṣa*
5. *Slakṣṇa*	*Khara*
6. *Sāndra*	*Drava*
7. *Mṛdu*	*Kaṭhina*
8. *Sthira*	*Sara*
9. *Sūkṣma*	*Sthūla*
10. *Viśada*	*Picchila*

In each pair the two partners having opposite characters balance each other. For example, if there is excess of *guru guṇa, laghu guṇa dravyas* should be administered to counteract it. These *guṇas* are again manifestation of *mahābhūtas* which are indicated by them (*guṇas*). As *guṇas* cannot be isolated in pure and abstract for the *dravya*, the use of *guṇas* will always have to be considered in the form of *dravya*. For this it is necessary to know the *dravyas* in terms of *guṇas*.

Vīrya

Definition

Vīrya is the potency by which the drug acts. *Vīrya* is more dominant in drugs while *rasa* is more dominant in dietetic substances.

It is observed that there is a principle in drug which is responsible for its action and in the absence of which there is no action. It is seen in daily practice that a particular part of the plant is used and not all parts at random,. The drug also loses action after a certain period or on defective processing. All this led to formation of a hypothesis regarding *vīrya*.

Effect of vīrya

Effects on doṣas :

1. Śīta	Pacifies *pitta*, aggravates *kapha* and *vāta*
2. Uṣṇa	Pacifies *kapha* and vāta, aggravates *pitta*.

Vipāka

Definition

Vipāka is the transformed state of ingested substance after digestion. This is also called *Niṣṭapāka* as opposed to *awasthapāka* (stages of digestion) or *prapāka* (initial transformation).

It is said to take place at the time of division of *rasa* and *mala* after digestion is completed. *Caraka* takes three *vipākas* as *madhura, āmla* and *katu. Madhra, amla* and *kaṭu* stand for *kapha, pitta* and *vāta* respectively.

Effect of vipākas

According to Caraka :

Vipāka	*Guṇa*	*Doṣa*
Madhura	*Snigdha, Guru*	*Kapha* increasing
Āmla	*Snigdha, Laghu*	*Pitta* increasing
Kaṭu	*Ruksa, Laghu*	*Vāta* increasing

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According to Suśruta:

Vipāka	*Doṣa*
Guru	*Kapha* increasing *Vāta pitta* decreasing
Laghu	*Vāta pitta* increasing *Kapha* decreasing

Karma

Definition

Karma is that which causes *samyoga* (conjunction) and *vibhāg*a (disjunction) irrespective of any other factor and is located in *dravya*. In the context of pharmacology this relates to action on organs, *doṣas, dhātus* and *malas* which is required for homeostasis of the person.

In other words, *karma* is the respose of the living tissue to *dravya.*

Theory of drug action

The mode of action of the drugs is based on the theory of *pañca mahābhūta.* As said above, the body is composed of five *mahābhūtas* and similar is the composition of drugs. Drugs when used combine with the selective *mahābhūtas* and by altering its quantity and quality produce their action by further influencing the respective *dosas, dhātus* and *malas* accordingly. This is a sort of selective *mechanism* more or less like the lock and key theory based on sturcture function relationship . As in the living body *pañca mahābhūta* is represented by tridoṣa there is a tradition of describing the action in terms of *doṣas* instead of *mahābhūtas.* The *bhautika* state of drugs on the other instead of *mahābhūtas.* The *bhautika* state of drugs on the other side is indicated by *rasa.*

For instance, if *madhura rasa* (*pārthivāpy*a) is administered it would thereby increase the *kapha doṣa dhātus* like *rasa, māṁsa, medas, majja* and *śukra* and *malas* like stool and urine which have predominance of *pṛthvi* and *āpdhātus.* Reverse will be the effect on administration of *tikta rasa.*

Prabhava

Dfefinition

The specific potency of a drug is knownm as *prabhāva.*

Nature of prabhāva

It is seen that two drugs though having similar *rasa, vipāka* and *vīrya* differ in action. This difference in action is owing to the specific chemical (*bhautika)* composition of the drug and its action can not be explained by general rule on the basis of *rasa, vipāka* and *vīrya*. For instance *danti* and *citraka* are similar in *rasa (kaṭu), vipāka (Kaṭu)* and *vīrya (uṣṇa)* but the former is *purgative* in action while the latter is not.

On the side of body response the drugs action on specific tussue, organ or disorder is said to have *prabhāva* and the action is directed to disezase and not towards *dosas.* For instance carediotonic action of *arjuna, anthelmintic* activity of *viḍanga*, antitoxic effect of *śirīṣa* are said to be due to *prabhāva.*

Bhaisajya Marga (Route of Medicine Administration)

Drug is administered through the channels of skin, mouth, eye, ear, nose, anus, urethra and *vagina*, The channel is selected according to the location of *doṣa.*

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Mātra (Dose)

Therapeutical propriety depends upon the dose (of the thgerapy) and time (of administration). Success of treatment depends upon the (observance of this) propriety. A physician, proficient in the principles of propriety is always superior to those who are acquainted with the *drugs* only.

While administration of medicines *mātra* has to be decided by observing the followintg aspects.

Consideration of dosa is very important to achieve the desired result because if the dose is too large it may cause harmful side effects, and if it is too small it would not be effective. Hence the dose may be so regulated that the drug may produce the desired effects but may not harm the tussues. It should be decided according to the condition of desease and the patient.

It is not possible to prescribe a fixed dose of medicines (uniformly for all patients). Dosage of medicines varies depending upon the following factors :

1. *Anukta* and *viśeṣokta dravya grahaṇa*
1. *Kāla* or time including the season when the drug is administered.
2. *Agni* or the power of digestion of the patient.
3. *Vayas* or the age of the patient.
4. *Bala* or the strength of the patient.
5. *Prakṛti* or the physical constitution of the patient.
6. *Doṣa* or the nature of the *doṣa* involved in the cousation of the disease.
7. *Deśa* or the nature of the *deśa* involved in the habitation of the patient.

Śarṅgadharta has suggested dosages according to age and preparations. According to him for one month old age child the dose should be one *ratti* (125mg.) which is to be given in the form of confection with milk, honey sugar and ghee. The dose is to be increased at the rate of one *Ratti* per month upto one year. Thereafter, the increase should be maintained upto the age of seventy, then decrease gradually in regressive manner, this is for powders as well as well as pastes but in the cases of decoction it should be four times.

According to preparation, the dose has been suggested as follows :

1.	*Swarasa*	- *1/2 pala*
2.	*Kalka*	- *1 Karṣa*
3.	*Cūrṇa*	- *1 Karṣa*
4.	*Kwātha*	- *1 pala*
5.	*Phāṇṭa*	- *2 palas*
6.	*Ghṛta*	- *1 Karṣa*
7.	*Taila*	- *1 Karṣa*
8.	*Hima*	- *1 pala*
9.	*Awaleha*	- *1 pala*
10.	*Āsava-Ariṣṭa*	- *2 Karṣa*
11.	*Guṭikā*	- *1 Karṣa per day*
12.	*Rasauṣadhas*	- *1/2 Ratti*

In *kalpas* of single drugs particularly for *rasāyana* use, a specific dosage is prescribed in which at first the dose is increased in gradual progressive manner and then decreased in the same but regressive manner, The dosage of *Bhallātaka Rasāyana* has been fixed in this way.

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Posology

The word posology is derived from the Greek word *Posos* means how much and *Logos* means science. That means it is a branch of medical science, which deals with doses, or quantity of *drugs*, which can be administered to produce the required pharmacological action.

The dose of a *drug* cannot be fixed rigidly because there are so many factors which influence the doses e.g. age, condition of the patient, severity of the disease natural tolerancwe, acquired tolerance, idiosyncrasy, route of administration, degree of absorption and rate of elimination. The doses listed below are not binding upon the *prescriber,* considering the above mentioned factors he can change the doses accordingly.

Doses Proportionate to Age

Calcultion of child dose :

The dose for a child from adult dose can be calculated by any one of the following formulas :

Young's rule :

Age in years

Age in years + 12

E.g. If the adult dose is 60 mg and the age of the child is 4 years.

The dose for the child will be

$$= \frac{4}{4+12} = \frac{4}{16} = \frac{1}{4}$$

$$= \frac{1}{4} \text{ x } 60 = 15\text{mg}.$$

Dilling's Rule :

Age in years 20

e.g. If the adult dose is 60 mg. And the age of the child is 6 years. The dose for the child will be

$$= \frac{6}{20} = \frac{3}{10}$$

$$= \frac{3}{10} \text{ x } 60 = 18\text{mg}$$

Because of quicker and easy calculations Dillings rule is considered better.

Doses Proportionate to surface area

The calculation of child dose according to surface area is more appropriate *rather* that the methods based on age. This method is more complicated than the methods based on age but tables have been provided by which dose for a child can be calculated. This method is based on the following formula :

Surface area of child x 100

Surface area of adult

Table :

Age	*Percentage of Adult Dose*
One month	10

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2 month	15
4 months	20
1 year	25
3 years	35
5 years	40
10 years	60
12 years	75
16 years	90

Māna

Regarding *māna* detailed information is mentioned under the chapter of *māṇa paribhāṣa*.

Mātra *(Dosage of Recipes)*

It is not possible to prescribe a fixed dose of medicines (uniformly for all patients). Dosage of medicines varies depending upon the following factors.

1. *Kāla* or time including the season when the drug is administered.
2. *Agni* or the power of digestion of the patient.
3. *Vayas* or the age of the patient.
4. *Bala* or the strength of the patient.
5. *Prakṛti* or the physical constitution of the patient
6. *Doṣa* or the nature of the *doṣa* involved in the causation of the disease.
7. *Deśa* or the nature of the habitation of the patient

A suitable dose of a medicine is to be fixed. (by the physician) keeping the above points in view.

Small Dose

The physician, aquainted with tradition, should administer *mṛdu* (less potent) medicines in smaller doses to the following categories of patients :

1. Those who are emaciated;
2. Those who have less power of digestion;
3. Those who despise (do not like taking) medicines;
4. Young children;
5. Pregnant women; and
6. Old people.

Large Dose

To strong persons having more of aggravated *doṣas*, the physician should administer strong medicines in a large dose.

Anupāna

यथा तैलं जले क्षिप्तं क्षणेनैव प्रसर्पति । अनुपानं बलादङ्गे तथा सर्पति भेषजम् ।। (च. सू. म. ६.५)
अनुपानंक्तं हितं युक्तं तर्पयत्याशु मानवम् । सुखं पचति चाहारमायेषु च बलाय च ।। (च. सू. २७.३२६)

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अथानुपानकर्मगुणान् प्रवक्ष्यामः - अनुपानं तर्पयति, प्रीणयति, ऊर्जयति, बृंहयति, प्र्याप्तिमभिनिर्वर्तयति, भुक्तमवसादयति, अन्नसंहातं भिनत्ति, मार्दवमापादयति, क्लेदयति, जरयति, सुखपरिणामितमाशुव्यवायितां चहारस्योपजनयतीति। (च. सं. सू. २७/३२७)

अनुपानं करोत्यूर्जा तृप्तिं व्याप्तिं दृढाङ्गताम् । अन्नसङ्घातशैथिल्यविक्लित्तिजरणानि च।।

(अ. ह. सू. ७.५२)

Śārṇgadhara concept regarding importance of anupana : Just as oil spreads quickly on water so also medicines spread inside the body by the strength of the vehicle.

The word meaning "*Anupānā* " is that a drink taken with or after medicine intake and also it is considered as " a fluid vehicle for medicine".

Anupāna is a very important factor which helps in absorption, assimilation as well as efficacy of the *drug*. This should be decided according to the constitution of the patient as well as condition of *dosa*. In *vātaja* conditions *snigdha - uṣṇa*; in *pittaja* conditions *madhura - śīta* and in *kaphaja , rūkṣa - uṣṇa anupana* is recommended.

The main vehicles used are cold and warm water, honey, *ghee, butter, sugar, jaggery,* milk etc. The pharmaceutical preparations like *swarasa, phāṇṭa, kwātha, hima, arka* etc. are also used as vehicles. One drugs particularly *rasausadhi,* may be used in various diseases with different vehicles. For instance, *makaradhwaja* may be useful in fever (*jwara*) when given with *Ārdraka swarasa* (*ginger juice)* and in internal *hemorrhages (Raktapitta)* with *vāsa swarasa.*

Usually *anupāna* can be selected on the basis of drug, patient, disease likewise.

1. *According to drug* - Such as warm water after *ghṛta.*
2. *According to patient* - Such as alcoholic preparations for debilitated and honey water for obese.
3. *According to disease* - Such as milk in *Raktapitta, Ārdraka* in *jwara.*

Caraka Concept

While explaining the properties of *Anupānā*, Scholar *caraka* mentioned that *Anupānā* drinks should have the properties opposite to those of the food taken. But at the same time, such drinks should not be harmful to the tissue elements (*dhāthus*) of the body. *Caraka* mentioned that *Jalam* (water) as well as the eighty four varieties of the *Āsavas* (alcoholic) preparations as *anupānās* and also it is mentioned that according to the *doṣa aggravation* specific quantities of *anupānā* choice is mentioned viz.

Dosa	*Properties*
Vāta	*Snigdha, Uṣṇa*
Pitta	*Madhura, Śīta*
Kapha	*Rūkṣa, Uṣṇa*

Anupana Karma (Action)

Tarpayati (bring about refreshment), *Prenayati (*Pleasure), *Ūrjayati* (energy), *brumhayati* (nourishment), *Paryapti* (spreads), *bhukta mavasādayatui* (it pushes food downward), *annasanghātam* (break downs food into small particles) *mārdhavam* (softening), *Kledayati, jarayati* (digesting), *Sukha parināmitamasuvyvayitam* (proper assimilation and instant diffusion of the food).

Suśruta concept

Suśruta says that after the intake of food, the drink (liquid) which is taken is called as *Anupānā.*

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Anupānā Dravyas

Suśruta mentioned that *śītajala, āsava, dravya pradhāna madhya, yūṣa, phalāmla, dhānyāmla*, milk, *māṁsa rasa* (essence of meat) and for whom the *anupānā* which is useful and suitable, that can be administered to them in prescribed dose. *Vyādhi* (disease), *Kāla* (time), *dravya* (drug), type of the food taken, all these should be taken into consideration and by using intelligence of physician *anupāna* has to be selected and administered.

The best *anupāna* is that *Mahendra jal* or *antarikṣajal* (water collected from rain directly and preserved in clean vessel). *Suśruta* also mentioned specific *anupanas* for specific disease conditions. Water may be taken in absence of the proper *anupāna* as after-drank in all cases. That kind of water is whole some to a person, to which he is habituated from his birth. Hot water is good in diseases which have their origin in the vitiated blood, or in the deranged *pitta*.

Extra Anupāna Actions Mentioned by Suśruta

Recanam, vṛṣyam, doṣasanghātabedanam, Śrama klama haram, Pipāsahartam, Varnakaram.

Time of Anupāna Administration

The *anupāna* which is taken before meals causes emaciation to body. If *anupāna* is taken in the middle of the food it maintains physiological condition of the body. The *anupāna* which is taken after food, nourishes and strengthens body.

Śāraṅghadhara Concept

Śāraṅghadhara mentionerd dose and mode of action of *anupāna*, in this way. If we are administering *anupāna* along with *cūrṇa, avaleha, guṭika, kalka, anupāna* dose should be three, two and one *pala* respectively for diseases of *vāta, pitta* and *kapha*. After administration of medicine with *anupāna*, as a drop of taila (oil) spreads in water very quickly, like that *anupāna* makes the medicine to spread all over the body rapidly.

According to *Rājanighaṇṭu, anupāna* is a part of medicine which is liquid form. After intake of medicine *anupāna* should be administered with some time gap. *Anupāna* facilitates good digestion during night.

According to *Yogaratnākara*, the *auṣadhi* or medicine administered to treat the disease, if given along with anupana intelligent *vaidya*, that medicine by having strenght (*bala*) of anupana definitely destroy or cures that specific disease.

In *Rastarangiṇi* the word *sahapāna* is mentioned. *Sahapāna* means, the liquid form which is taken with main drug and which can facilitates easy disintegration, easy absorption and uniform distribution of medicine all over the body hence that liiquid form is called *sahapāna*.

According to *rasatarangiṇi* with main drug *sahapāna* and *anupāna* alos mentioned for administration at one time,

Restrictions has to be Followed After Intake of Anupāna

Long walk, a lengthy conversation, singing, sleeping and reading.

Auṣadha Sevanakāla (Time of Medicine Administration)

न ह्यप्राप्तातीतकालमौषधं यौगिकं भवति, तस्य त्वेकादशधावचारणम्। तद्यथा–अभक्तं प्राक्भक्तं मध्यभक्तमधोभक्तं सभक्तमनन्तरभक्तं सामुद्गं मुहुर्मुहुः सग्रासं ग्रासान्तरं निशि च। (अ. सं. सू. १३.१२)

The following times have been prescribed for administration of drugs :

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Abhakta (On Empty Stomach)

The drug exerts strongest action if given on empty stomach hence this should be prescribed for strong persons and in disorders due to aggravation of *kapha.*

Pragbhakta (Before Meal)

This is useful in diseases due to *apāna vāyu* and also for toning up the intestinal muscles.

Madhyabhakta (During Meal)

This is prescribed in diseases due to *samana vayu* and gastrointestinal distrubances particularly *paittika* ones.

Adhobhakta (After Meals)

After lunch the *drug* should be given in diseases of *vyāna Vāyu* and after dinner in those of *Udāna Vayu.* This strengthents the upper part of the body, is used in its disorders particularly *Kaphaja* ones and also for *Bṛmhaṇa.*

Samabhakta (Mixed with Food)

This is prescribed in children, delicate persons and those having aversion to medicines, *anorexia* and in diseases spread all over the body.

Antarabhakta (Between Meals in Day)

The drug is taken first afternoon after the midday meal is degested and sufficiently before the evening meal. This is used in persons having good digestion and in disorders due to *Vyāna Vāyu.*

The same is applicable in relation to meal in night.

Samudga (Before as well as After Meals)

Avaleha, Cūrṇa etc. are used along with light meal in hiccough, trembling, convulsions, disorders of thigh, upper and lower parts of the body.

Muhuh Muhuh (Off and On)

It does not matter whether the patient has taken meal or is empty stomach, the drug is to be given off and on as in cases of dyspnoea, cough, hiccough, thirst, vomiting and poisoning.

Sagrasa (With First Morsel)

The medicine is mixed with the first morsel of meal and is taken as such. *Cūrṇa, vaṭika, Leha* etc. are used in this way for the purpose of *dipana* and *Vājīkarana. Hingwāṣṭaka Cūrṇa* is well known example of this . this is useful in disorders of *Prāṇa Vāyu.*

Grāsantara (Between Morsels)

This is useful in disorders of Prāṇa Vāyu particularly in heart disease.

Nisa *(In the Night at Bed-Time)*

This is useful in disease of head, mouth, eye, ear, nose and throat. *Vamana* and *Dhūma* are used in this way.

Śārṅgadhara has made it concise in five including all the subdivisions in the same.

ज्ञेयः पञ्चविधःकाले भैषज्यग्रहणे नृणाम् । किञ्चित् सूर्योदये जाते, तथा दिवसभाजने ।।
सायन्तने भोजने च, मुहुश्चापि, तथा निशि ।। (शा. सं. प्र. २.३)

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Medicines are generally administered in the morning specially so the *kasayas* (decoctions). Sunrise (morning), the time of midday meal night meal, frequent intervals, and bed-time : these are the five suitable times for the administration of medicines.

Kalpanās and their Savīryatā Avadhi (Formulae and Their Expiry Dates)

The preservation and storage procedures described in *Āyurvedic* pharmaceutics are also based on scientific lines. The fact that the *cūrṇas* (powders), *tailas* (oils), *ghṛitas* (ghee) etc. become unstable after the respective periods. The ever-lasting shelf-life of *Āsavas* and *Ariṣṭas* mentioned in the tests could be very well related to the alcoholic medium of these preparations.

गुणहीनं भवेद्वर्षादूर्ध्वं तद्रूपमौषधम् । मासद्वयात्तथा चूर्णं हीनवीर्यत्वमाप्नुयात् ।।
हीनत्वं गुटिकालेहौ लभेते वत्सरात्परम् । हीनाः स्युर्घततैलाद्याश्चतुर्मासाधिकात्तथा ।।
ओषध्यो लघुपाकाः स्युर्निर्वीर्या वत्सरात्परम् । पुराणाः स्युर्गुणैर्युक्ता आसवा धातवो रसाः ।।
व्याधेरयुक्तं यद्द्रव्यं गणोक्तमपि तत्त्यजेत् । अनुक्तमपि यद्युक्तं योजयेत्तत्र तद्बुधः ।।

(शा. सं. प्र. १-५१-५४)

Stability Period of Different Categories of Preparations According to Śāraṅgadhara

Generally, *auṣadhis* (medicinal recipes) lose their potency after one year of their preparation, *cūrṇas* after two months, *guṭikās* and *lehyas* after one year, *ghṛtas* and *taila* after 16 months (according to some scholars 4 months), recipes *laghu paka* which will be digested easily and quickly, become poor in action after one year. While *āsavas* and *dhātus* (metal and mineral recipes) become more potent as they become old. If in a prescription, drugs included are inappropriate for the diseases, the wise Physician should omit them, and can include *drugs* suitable for the disease even though not mentioned in the prescription.

As it is mentioned that, different time duration periods for different forms of medicine by ancient authentic *Āyurvedic Scholars* having a very good scientific rational background. As they mentioned the *Pañcavidha Kaṣāyas,* because they contains water content abundantly and also Carbohydrates within them, hence organisms will reach the substance very quickly. Because of Glucose, carbohytdrate and water content, the medicine also will get spoiled very shortly. So that, the time period mentioned to these formulations is very short. Whereas *cūrṇas* are given within two months time, because they were made with dried form of herbal remedies. But *vaṭi is* given shelf life time more, because the surface area of the *vaṭi* will be reduced markedly than that of *cūrṇa*. Because of lesser surface area it will be exposed to outer atmosphere in lesser extent than the *curna* form. So that its expiry period was explained as one year.

Tests of *Āyurveda* recommended for *Auṣadha* and *āhāra kalpanā's* and their *savīryata avadhi* (Diet and medicinal formulae and their expiry dates, i.e., the period for which they can retain potency). The following are intended to serve as guidelines for the purpose.

1. *Swarasa*	*Sadhyosevana*
2. *Kalka*	*Sadhyosevana*
3. *Basti kalpanā*	Should be used immediately after preparation
4. *Manda kalpanā*	*Sadhyosevana*
5. *Taṇḍulodaka*	*Sadhyosevana*
6. *Māṁsa Rasa*	*Sadhyosevana*
7. *Pamathya*	*Sadhyosevana*

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8.	*Kṛśara*	*Sadhyosevana*
9.	*Peya*	*Sadhyosevana*
10.	*Kāmbalika*	*Sadhyosevana*
11.	*Rāga*	*Sadhyosevana*
12.	*Ṣāḍava*	*Sadhyosevana*
13.	*Vāṭyodana*	*Sadhyosevana*
14.	*Sikta*	*Sadhyosevana*
15.	*Vesavāra*	*Sadhyosevana*
16.	*Udasvita*	*Sadhyosevana*
17.	*Mathitha*	*Sadhyosevana*
18.	*Kaṭvara*	*Sadhyosevana*
19.	*Śankadrava*	*Sadhyosevana*
20.	*Āschyotana*	*Sadhyosevana*
21.	*Viḍālaka*	*Sadhyosevana*
22.	*Tarpak*	*Sadhyosevana*
23.	*Puṭapāka Swarasa*	*Sadhyosevana*
24.	*Kavala*	*Sadhyosevana*
25.	*Gaṇḍūṣa*	*Sadhyosevana*
26.	*Upanāha Kalpanā*	Till it is in hot state after the preparation.
27.	*Kwātha Kalpanā*	With in 4 *yāmas* (12 hours)
28.	*Kṣīra Pāka Kalpanā*	1 day (Should be used in *sukoṣna* state only)
29.	*Anna Kalpanā* (*Bhkta Kalpanā*)	1 day (Should be used in *sukoṣna* state only)
30.	*Yavāgu Kalpanā*	1 day (Should be used in *sukoṣna* state only)
31.	*Pānaka Kalpanā*	1 day
32.	*Mantha Kalpanā*	1 day
33.	*Udaka Kalpanā*	1 day
34.	*Takra Kalpanā*	1 day
35.	*Peya Kalpanā*	1 day
36.	*Yūṣa Kalpanā* (*Akruta yūṣa Kruta yūṣa*)	1 day (Should be used in *sukoṣna* state only)
37.	*Vilepi Kalpanā*	1 day
38.	*Dadhi Kalpanā*	1 day
39.	*Dadhi Kūrchika Kalpanā*	1 day
40.	*Lepa Kalpanā*	Prepared *lepa* for 1 day
41.	*Lākṣā rasa Kalpanā*	7 days
42.	*Saktu Kalpanā*	1 month
43.	*Khaṇḍa Kalpanā*	1-4 months
44.	*Cūrṇa Kalpanā*	2 months (If it is nicely packed, kept in good condition, can stay upto 1 year)

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45. *Malahara Kalpanā*	2 months (If it is necely packed, kept in good condition, can stay upto 1 year)
46. *Pāka Kalpanā*	2-4 months
47. *Dhūmrapāna Kalpanā*	4 months
48. *Śarkara Kalpanā*	4 months (If it is nicely packed, kept in good condition, can stay upto 1 year)
49. *Kṣāra Sutra*	4-6 months
50. *Sneha Kalpanā (ghṛta & Taila)*	4 months (According to some scholars 16 months)
51. *Dhūpana Kalpanā*	6 months (Can stay till the volatile principles and smell is lost)
52. *Āmla Sandhāna*	
a. *Arnāla*	6 months
b. *Dhānyāmla*	6 months
c. *Śukta*	6 months
d. *Kānjika*	6 months
e. *Tuṣodaka Dried herbs*	6 months
53. *Anjana Kalpanā*	1 year
54. *Arka Kalpanā*	1 year
55. *Ghana Sattva Kalpanā*	1 year
56. *Masi Kalpanā*	1 year
57. *Rasakriya Kalpanā*	1 year
58. *Lavaṇa Kalpanā*	1 year
59. *Varti Kalpanā*	1 year
60. *Kāṣṭa Auṣadi sattva*	1 year
61. *Guggulu Kalpanā*	1 year
62. *Kṣāra Kalpanā*	1 year
63. *Vaṭi Kalpanā*	1 year (If it is nicely packed, kept in good condition, can stay more than 1 year
64. *Kumbha Ghṛta*	100 years (The ghrta kept in earthen pot and called *Purāṇa ghṭta*)
65. *Ayaskṛti Kalpanā*	Older then better
66. *Āsava-Ariṣṭa Kalpanā*	Older then better
67. *Parpaṭi Kalpanā*	Older then better
68. *Bhasma Kalpanā*	Older then better
69. *Poṭṭali Kalpanā*	Older then better
70. *Madya Kalpanā*	Older then better
71. *Khanija sattva*	Older then better

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Auṣadha Saṁrakṣana Vidhi
(Guidelines for the Storage of Medicines)

When medicine is prepared by following all the restrictions if it is not stored properly it will get spoiled hence *Ācāryas* have mentioned the qualities of the room in which *auṣadhies* are to be stored. The room should have entrance towards East or North, should have free aeration, ventilation, there should be *Gandha, Dhūpa, Balikarmas,* conducted frequently.

As a rule, all the medicines which are prepared should be kept in air tight glass jars or porcelain jars and should not be exposed to light or air. Medicines are more difficult to preserve than to manufacture. If not stored by groups, they are hard to locate when needed and to know what is available and what is not. The following guidelines, if followed, prevent such confusions. If the medicines are arranged properly, there will also be an attraction.

1. Storehouse should face the road, but not far from it, on high ground.
2. It should be spacious, with high ceiling and well ventilated.
3. It should have shelves and cupboards for all medicines.
4. Cupboards should have individual locking arrangements.
5. Medicines should be kept off the floor.
6. Medicines should be kept in clean containers preferably of glass, all containers properly labelled, closed, sealed and wrapped.
7. Leave two-finger space between containers for easy handling.
8. It will be inconvenient to keep them in more than two rows on a shelf.
9. Labels should be towards the front, with bigger containers at the rear and smaller ones in front, so that all labels are visible.
10. It will no doubt be a precaution to have labels on the container and wrappers.
11. Poisonous items should be stored separately, the word Poison being written on them in blue or red ink in the Mother tongue and english, and stored with due care.
12. Inspect daily to see that labels are not damaged, contents have not gone bad and lids are not open.
13. Remove any spoilt product then and there, and find suitabgle remedy for any other defect. This should never be deverred.
14. Burn a stove or candle in the storehouse during rainy and cold sessons for warmth. The second floor is preferred for storage during these seasons.
15. Drizzle, dew, cold and moisture are harmful to medicines; so is direct sunlight in many cases.
16. Different groups of medicines must be stored in separate rooms or shelves.
17. *Ariṣṭas* must be held in specially strong bottles away from other items due to the risk of the bottles bursting.
18. Oils are best kept in china porcelain jars properly closed and taken into bottles only when necessary.
19. Pills must be exposed to the sun once every week in their containers. Those dried in shade must be covered with a thin cloth during such exposure.
20. *Ghṛtas* are also to be stored like oils, but in wide mouthed jars.

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21. Powders should be packed in bottles when hot and the bottles exposed to sun weekly.
22. *Tailas* should be kept in glass- stoppered bottles. Those with strong scent or potency should be sealed with wax or lac.
23. Additives are to be kept in a secure place in glass containers, properly sealed with wax.
24. Metal containers demand some caution. Glass and China containers are acceptable in all cases.
25. Storehouse should always be under lock and key.
26. Special attention is to be paid to keep the store-house and surroundings scrupulously clean.

Auṣadha Saṁrakṣana Vidhi According to Modern Pharmaceutics

Eventhough utmost care might have been taken during the formulation of any preparation, but if it is not preserved and packaged properly the entire purpose gets deveated. Hence all the measurements to be taken to increase the stability period of pharmaceutical products, by utilizing proper stabilizers. The medicines has to be packed properly.

Stability or Expiry Date or Shelf Life of Medicine

Stability of a pharmaceutical product may be defined as the capability of a particular formulation in a specific container to remain within the physical, chemical, microbiological, therapeutic and toxicological specifications. The substances which are used to control these stabilities are known as stabilizers. The most important stabilizer are are the antioxidants and preservatives.

Antioxidants

An antioxidant is a substance which is added to a pharmaceutical formulation to prevent the oxidative degradation of the *drug*. The antioxidants have great affinity for oxygen and when they are added to formulation they compete for it affording protection to other oxygen sensitive drug. An ideal antioxidant should be stable and effective against a wide range of pH, colourless, nontoxic, nonirritant, thermostable and compatible with formulation ingredients and packaging material. Some of the commonly used antioxidants are sodium bisulphate, sodium metabisulphate, Sodium thiosulpaate, sodium metabisulphate, Sodium thiosulphate, ascorbic acid, ascorbyl palmitate hydroquinone, propylgallate, butylated hydroxy toluene, butylated hydroxyanisole and tocopherols.

Preservatives

A preservative is a substance which is added to pharmaceutical formulations to prevent or inhibit the growth of micro-organisms in the preparations. They are added to all formulations which are to be stored for long periods of time and the ingredients of which support microbial growth. The emulsions and suspensions (Eg. *Pānaka, śarkara, kwātha* etc.) containing water and carbohydrates as emulsifying and suspending agents respectively, must be suitably prserved because water and carbohydrates provide very good medium for the multiplication of bacterias and molds.

A preservative is unnecessary in multidose containers prepared by heating with bactericide because they already contain a lethal substance, nor they are necessary in preparations which contain medicaments having bactericidal properties.

Choice of Preservatives

The Preservative selected should have the following properties :

1. It should be effective against a wide range of microorganisms.
2. It should be compatible with other ingredients of the formulation.

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3. It should be soluble in aqueous phase when used in emulsions.
4. It should be nontoxic.
5. It should be free from odour and taste.
6. It should preserved the preparation and remain stable for shelf life of the product.

No single preservative possess all the qualities therefore it becomes necessary to use a combination of preservatives to prevent the growth of micro-organisms. The most commonly used preservatives are as follows :

1. Benzoic acid and sodium benzoate 0.1 to 0.2 %
2. Salicylic acid 0.1 %
3. Phenol 0.2 to 0.5 %
4. Chlorecresol 0.05 to 0.1 %
5. Alcohol 15 to 20 %
6. Chlorbutanol 0.5 %
7. Phenylmercuric nitrate 0.002 to 0.005 %
8. Sorbic acid and its salts 0.05 to 0.2 %
9. Benzalkonium chloride 0.004 to 0.02 %
10. Methyl paraben and propyl paraben 0.1 to 0.2 %

Packaging of Pharmaceuticals

Packing is the process by which the pharmaceuticals are suitably packed so that they should retain their therapeutic effectiveness from the time of their packaging till they are consumed. Packaging may be defined as the art and science which involves preparing the articles for transport, storage. Display and use. An utmost care might have been taken during the formulation of any preparation but if it is not packaged properly the whole aim may be lost. Different shapes and sizes of containers made from deifferent materials are used for packing different types of formulations. Therefore a careful coinsideration must be given for the selection of packaging material.

A package may consists of following things :

Container

A container may be defined as defined as a device in which the drug is enclosed and is in direct contact with the drug. A container which remains in contact with the drug at all times is known as immediate container.

Closure

A closure is a device which seals the container to exclude oxygen, carbon dioxide, moisutre micro-organisms and prevents the loss of volatile substances. It also prevents the loss of medicament during transport and handling.

Carton

Carton is the outer covering which gives seconmdary protection against mechanical and other environmental hazards. They are made from cardboard, moulded wood pulp or expanded polystyrene.

Box

A box is a device which is generally used for packing multiples of the product. It gives primary protection against external hazards during the transport and handling. A box is usually made from thick cardboard, wood or any other suitable material.

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Characteristics of containers And Closures

1. The container must be sufficiently strong to withstand handling while empty, when filling, closing, sterilizing, labelling, transport, storage and use by the consumer.
2. They should not allow any loss of product due to leakage, spillage or permeation.
3. The material of the container from which they are prepared must not react with the contents.
4. They must be able to withstand heat if process includes sterilization buy heat.
5. The surface of the container must be clear for easy labelling.
6. The container must not absorb substances from the preparation e.g. absorption of water and oily substances from ointments and creams by the cardboard boxes.
7. The container must not impart its own colour, taste and odour to the preparation.
8. The container and closure must not react either each other or with the preparation.
9. The container should be able to protect light sensitive preparations for which amber coloured glass containers may be used.
10. The size of the container must be selected according to the size of the preparation.
11. The closure must be easy to remove and replace.
12. The cost of container and closure is an integral part of overall cost of the preparation, so it should not be high.
13. A container should facilitate the identification of a product i.e. whether meant for internal or external use.
14. A part from all these characteristics a container and closure should be attractive in appearance and must have sale promotional and marketing values.

According to the Method of Closure and Use, the Continers are of Following Types

1. Well closed containers
2. Air-Tight containers
3. Hermetically-Sealed containers
4. Light resistant containers
5. Single Dose containers
6. Multi dose containers
7. Aerosol containers

Well Closed Containers

A well closed container is used to protect the preparation from contamination by extraneous solids, to prevent the loss of potency of active constituents and to prevent of loss of contents during transport, storage and handling.

Air-Tight Containers

Air tight containers are used to protect the contents from atmospheric contamination of liquids, solids or vapours. They prevent the loss of drugs due to efflorescence, deliquescence or evaporation.

Hermetically-Sealed Containers

Hermetically sealed container is that which does not allow the air and other gases to pass through it. Generally these types of containers are used for injectables. A glass ampoule sealed by fusion is the most common example of these types of containers.

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Light Resistant Containers

Light resistant containers are used to protect the drugs which undergo decomposition in the presence of light. Such drugs may be enclosed in light resistant amber coloured or opaque containers.

Single Dose Containers

They are used to supply only one dose of the medicament. They are sealed in such a way that the contents cannot be removed without removing the seal, the contents so removed are consumed immediately e.g. ampoules.

Multi Dose Containers

A multi dose container holds a number of doses . It is sealed in such a way that successive doses can be withdrawn easily without changing the strength, quality or purity of the remaining contents e.g. multidose vials.

Aerosol Containers

Containers for aerosols must be strong enough to withstand the pressure evolved inside the container at the time of use of the preparation.

Classification of Containers Accdording to their Shapes

1. Glass/polythene bottles (1) Narrow mouth (2) Wide mouth
2. Dropper bottles
3. Collapsible tubes
4. Gallipots
5. Cardboard Boxes
6. Ampoules
7. Vails
8. Polythene packets for intravenous fluids.
9. Posythene bottles for introvenous fluids.
10. Aerosole containers
11. Envelops, strips, cartons, boxes, drums etc.

Materials Used for the Manufacture of Continers

The following materials are used for the manufacture of containers. They are used either singly or sometimes in combination with each other.

1. Glass 2. Plastics 3. Metals 4. Paper

Glass

Glass is mostly produced by heating a mixture of silica (SiO_2), soda ash (Na_2CO_3), and limestone ($CaCO_3$) in a furnace at about 1400° C . The fused mass on rapid cooling forms glass which is soft in nature and is used for making bottles, light bulbs etc. But if potassium carbonate is used instead of sodium carbonate, a hard glass is produced which is used for the preparation of laboratory glass apparatus. Special types of glass e.g. coloured glass or adding certain other substances to the three basic components can produce heat- resistance glass.

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Advantages of Glass Containers

1. They are transparent which allows the visual inspection of the contents.
2. They are economical.
3. They are readily available in various shapes and sizes.
4. They are chemically inert.
5. They are quite strong and rigid.
6. They posses superior protection properties.
7. They do not deteriorate with age.
8. Some glass containers are heat resistant so they can be readily sterilized by heat.
9. Glass containers can be easily cleaned without any damage to its surface e.g. scratching or bruising.
10. As the composition of glass may be varied by adding suitable amounts and types of sand and silica as well as conditions of heat treatment used the proper container according to desired qualities can be produced.

Various types of glass used for pharmaceutical purposes are :

a) Coloured glass
b) Neutral glass
c) Type I-Borosilicate glass
d) Type II-Treated soda-lime glass
e) Type III-Soda lime glass
f) Type NP-Non- parenteral glass

Coloured Glass

Coloured glass is used for light sensitive products. For this purpose amber coloured glass is generally used which does not allow the U.V. rays to pass through it.

Neutral Glass

It is resistant to alkalies, weathering and can withstand autoclaving.

Type-I Borosilicate Glass

It has a high melting point and can withstand high temperatures It is also resistant to chemical substances.

Advantages of Plastic Containers

1. They are cheaper as compared to other containers.
2. They can be readily produced on large scale.
3. They are unbreakable, tough and flexible.
4. They are light in weight and can be easily transported.
5. They can be moulded into various shapes and sizes.

Paper

Paper and board as packing material is widely used in pharmaceutical industries in one form or the other. They are used to prepare, containers ranging from envelops used for dispensing powders, a few tablets or a few capsules on the counter, to the drums used for storing large quantities of drugs in the industries. Cartons and boxes made from board are used for packing the pharmaceutical containers.

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Treating it with plastic, wax or other materials can modify properties of paper and board. Now a days chemically treated paper known as tetra pack paper is also available for storing the drugs and chemicals. Such treated paper will protect the products from atmospheric conditions.

Materials Used for the Construction of Closures

1. Cork 2. Glass 3. Plastics 4. Rubber 5. Metals

Cork

Cork is essentially a wood obtained from the bark of oak tree. It is used for the manufacture of stoppers for narrow mouth bottles. Cork is almost chemically inert and does not impart undesirable odour or flavour to the preparation. The main disadvantage of these closures is that sometimes they lead to mould growth when used for aqueous preparations and may shed particles to products it not used carefully.

Glass

As compared to cork, glass is an ideal material for making the stoppers but these stoppers have the difficulties that they does not provide leak proof closures moreover they can slip out of the containers easily during transport and handling. Therefore the use of glass closures is restricted to laboratory glass apparatus e.g. reagent bottles and fancy cut glass items only.

Plastics

As compared to cork, glass, rubber and metal closures, plastic closures, are becoming more popular day by day because they are unbreakable, light in weight, can be easily moulded into various shapes and sizes. Plastic closures selected must be tested before use for any extractive material present in them and for their reaction with the product contained in the bottle.

Rubber

Natural rubber consists of latex obtained from Heavea braziliensis commonly known as rubber plant. This rubber imparts a chartacteristic odour to the product therefore the physical and chemical properties of rubber are altered by the addition of some additives such as :

1. Vulcanising agent e.g. sulphur.
2. Accelerators e.g. thiazoles.
3. Activators e.g. zinc oxide, stearic acid and zinc stearate.
4. Fillers e.g. carbon black, calcium carbonate, zincoxide, talc etc.
5. Softness e.g. mineral oils etc.
6. Antioxidants.
7. Pigments e.g. oxides and sulphides of iron, cadmium etc.
8. Lubricants e.g. zinc stearate etc.

Rubber closures are mainly used for vials, multidose containers and I/V fluid bottles because of its self sealing properties and it can withstand sterilization temperatures better than plastic closures. Rubber is also used for making the washers required in certain containers.

Metals

Tin plate and aluminium are most commonly used for the manufacture of closures but aluminium is most widely used for this purpose because it is ductile in nature and closure of any desired shape and size can be easily manufactured with it. Further, tear of closures can only be made from aluminium.

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Strip or Blister Packaging

Unit dosage form of drugs like tablets and capsules are enclosed individually in strip or blister packs. In strip packing the unit drugs are hermetically sealed in between strips of aluminium foil or plastic film. The contents are removed by tearing or cutting the individual pocket. In blister packing the unit dosage forms are enclosed in between transparent blisters and suitable packing material, generally aluminium foil. The contents are removed simply by pushing the drug through the packing strip.

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Chapter 17

MĀNA PARIBHĀṢA

मीयतेऽनेनेति मानम् । (अमरकोशे - दीक्षित:)

न मानेन विना युक्तिर्द्रव्याणां जायते क्वचित् । अत: प्रयोगकार्यार्थं मानमत्रोच्यते मया ।। (शा. सं. प्र. १.१४)

दोष-भेषज-देश-काल-बल-शरीर-सार-आहार-सात्म्य-सत्व-प्रकृति-वयसां मानमवहितमनसा यथावज्ज्ञेयं भवति भिषजा, दोषादिमानज्ञानायत्तत्वात् क्रियाया: । न ह्यमानज्ञो दोषादीनां भिषग्व्याधिनिग्रहसमर्थो भवति ।

(च. वि. १.३)

परिमाणं विना क्वापि नागदाज्जायते फलम् । तस्मात् सर्वे यतन्तेऽत्र परिमाणविधौ सदा ।। (वै. परि. प्रदीप)

मानापेक्षितमाचार्य्या भेषजानां प्रकल्पनम् । मेनिरे यत्ततो मानमुच्यते पारिभाषिकम् ।। (वै. परि. प्रदीप)

The knowledge about *māna* (measurement) is very essential for *Āyurvedic* physician.Without the knowledge of weights and measurements, appropriate combination of ingredients in a recipe is not possible.

विना चन्द्रिकला चन्द्र: प्रतापेन विना रवि: । विनाऽपिरोचिषा तद्वद्वेद्य स्यात्परिभाषया ।।

(Iatro-Che. of Āyurveda-rasaśāstra, Chapter-I)

As the moon looks lustureless without the (cooling) moon- light and as the sun appears dull without its hot rays. Similarly a physician becomes ineffective if he is without the knowledge of various technical terms.

Māna plays very important role in following aspects:

1. Raw drug collection, 2. Preparation of different *Kalpana's*, 3. *Anupāna mātra*, 4. Preparation of *Āhara Kalpanā* (*pathya kalpanā*) etc.

Raw Drug Collection

While doing raw drug collection, it is mentioned that, in particular season particular *prayojyānga* of plant is supposed to be collected. E.g. : *Mūla-Grīṣma ṛtu,* time for *jāntava dravya* collection is also mentioned e.g. : *Rakta, Roma, Nakha* has to be collected from adult animals.

Preparation of Different Kalpanā's

The relevent portions in the treatise and texts on *Āyurvedic pharmaceutics* apart from the qualitative aspects, also specifies the ratios and amounts of drugs to be taken for different formulations. A sceptic look into these show that, the quantitative fundamentals specifically mentioned for the respective preparations should not be changed. If changed, then the quality of the medicine suffers or the preparation may totally go wrong. E.g., in the preparation of any medicated oil (*taila kalpanā),* the *kalka, taila* and *dravadravya* are taken in the ratio of 1:4:16 in general. Instead of taking one part of the *kalka,* if three or four parts are taken the moisture content of the formula may be increased and its shelf life will decrease, or the final product may have a different medicinal value. Alterations in quantity on any of the above three *kalka, taila* and *dravadravya* would either increase or decrease the period of processing, due to which the preparation will not be up to the required standards and cannot be preserved for long.

Anupāna Mātra

Anupāna which is given along with some main medicine, also should be administered in particular quantity, e.g. *Anupāna*(vehicle for the medicine) for *cūrṇa, guṭika, kalka* should be three, two one *pala* respectively. For diseases of *vāta, pitta* and *kapha*.

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Preparation of Āhara Kalpanā

While preparing different *pathya kalpanās* (dietic regimens), the amount and ratio of *dhānya* and water etc to be added are also mentioned by following *māna* (measurements) only.

E.g.- for preparing *maṇḍa kalpanā,*

Śāli dhānya	-	1part
Water	-	14 parts

Are supposed to be taken, so that, knowledge about *Māna* to the *Āyurvedic* physician is essential. Hence *Ācāryas* given utmost importance to the *māna*.

According to the Nature of the Substance the Varierties of Māna

पौतवं द्रुवयं पाय्यमिति मानार्थकं त्रयम् । मानं तुलाङ्गुलिप्रस्थैः गुञ्जाः पञ्चाद्यमाषकः ।। (अमरकोशः २.१.८५)

पाय्यं हस्तादिभिर्मानं द्रुवयं कुडवादिभिः। पौतवं तुलया तस्य सूत्रं स्याद्भागसूत्रकम् ।। (वैजयन्तीकोशः)

1. *Payyamāna* (measurement of length)
2. *Dravayamāna* (measurement of liquid)
3. *Pautavamāna* (measurement of weight)

Payyamāna

By this *māna* we are able to measure the length of the herbal drugs, medical instruments, patient height, pharmacy measurements etc.

Dravayamāna

By this we are able to measure the quantity (volume) of liquid, eg. 1 *seru*.

Pautavamāna

By this *māna* we are able to measure the weight of the drug eg. Different *auṣada mātras* like *kalka mātra - ardha pala* etc.

Kālamāna (Measurement of Time)

While preparing the different medicines, the time adjustment should be taken into consideration and also time of medicine administration (*auṣadha sevana kāla)* after preparation, preservative time also will be decided depending upon the *kāla* (time) only, eg. :

1. *Vatsanābhi śodhana* should be done for three hours i.e. one *yāma* for three days.
2. Administration of medicine after food (*adhobhakta*) for *Kaphaja roga* treatment.
3. *Cūrṇas* should be taken with in the time period of two months.

Weights and Measures of Different Types

System of weights and measures will be described first without which dealing with *drugs* and recipes will be impractical.

In ancient times (even at present times) the scale of weights and measures differed in different parts of India. Four separate scales were mentioned by old compilers. Those were *Māgadhi* or *Māgdha* and *Kālinga*.

मानं च द्विविधं प्राहुः कालिङ्गं मागधं तथा । कालिङ्गान्मागधं श्रेष्ठमेवं मानविदो विदुः ।। (च. क. १२.१०५)

कालिङ्गं मागधं चेति द्विविधं मानुमुच्यते । कालिङ्गान्मागधं श्रेष्ठं मानं मानविदो विदुः ।। (इति कलिङ्गपरिभाषा)

मानं च द्विविधं प्रोक्तं कालिङ्गं मागधं तथा कलिङ्गान्मागधं श्रेष्ठमिति मानविदो विदुः ।।

(योगरत्नाकरः मानपरिभाषाः पृष्ठ २१)

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कालिङ्गं सौश्रुतं मानं मागधं चरकोदितम् ।। (Iatro-che. of Āyurveda-rasaśāstra, chapter-I)

Weights and measures are of two types, viz., *Kāliṅga* (which was prevalent in the ancient state of *Kaliṅga* = present Orissa in the Eastern Coast of India) and *Māgadha* (which was prevalent in the ancient state of *Māgadha* = present Bihar in the North India). The latter (*māgadha*) is better than the former (*kāliṅga*). *Kāliṅga* type is followed or adopted by *Suśruta* (belonging to the school of surgery) and *Māgadha* type of weights and measurements are followed by *Caraka* (belonging to the school of medicine).

Māgadha Māna

त्रसरेणुर्बुधैः प्रोक्तस्त्रिंशता परमाणुभिः । त्रसरेरुणुस्तु पर्यायनाम्ना वंशी निगद्यते ।।
जालान्तरगते भानौ यत्सूक्ष्मं दृश्यते रजः । तस्य त्रिंशत्तमो भागः परमाणु स कथ्यते ।।
जालान्तरगतैः सूर्यकरैर्वंशी विलोक्यते। षड्वंशीभिर्मरीचिः स्यात्ताभिः षड्भिस्तु राजिका ।।
तिसृभि राजिकाभिश्च सर्षपः प्रोच्यते बुधैः । यवोऽष्टसर्षपै प्रोक्तो गुञ्जा स्यात्तच्चतुष्टयम् ।।
षड्भिस्तु रक्तिकाभिः स्यान्माषको हेमधान्यकौ । माषैश्चतुर्भिः शाणः स्याद्धरणः स निगद्यते ।।
टङ्कः स एव कथितस्तद्द्वयं कोल उच्यते । क्षुद्रको वटकश्चैव द्रङ्क्षणः स निगद्यते ।।
कोलद्वयं च कर्षः स्यात्स प्रोक्तः पाणिमानिका । अक्षं पिचुः पाणितलं किंचित्पाणिश्च तिन्दुकम् ।।
विडालपदकं चैव तथा षोडशिका मता । कममध्यो हंसपदं सुवर्णं कवलग्रहः ।।
उदुम्बरं च पर्यायैः कर्ष एव निगद्यते । स्यात्कर्षाभ्यामर्धपलं शुक्तिरष्टमिका तथा ।।
शुक्तिभ्यां च पलं ज्ञेयं मुष्टिराम्रं चतुर्थिका । प्रकुञ्चः षोडशी बिल्वं पलमेवात्र कीर्त्यते।।
पलाभ्यां प्रसृतिर्ज्ञेया प्रसृतश्च निगद्यते । प्रसृतिभ्यामञ्जलिः स्यात्कुडवोऽर्धशरावकः ।।
अष्टमानं च स ज्ञेयः कुडवाभ्यां च मानिका । शरावोऽष्टपलं तद्वज्ज्ञेयमत्र विचक्षणैः ।।
शरावाभ्यां भवेत्प्रस्तश्चतुष्प्रस्थैस्तथाढ़कम् । भाजनं कंसपात्रं च चतुःषष्टिपलं च तत् ।।
चतुर्भिराढकैर्द्रोणः कलशो नल्वणोर्मणः । उन्मानश्च घटो राशिर्द्रोणपर्यायसंज्ञकाः ।।
द्रोणाभ्यां शूर्पकुम्भौ च चतुःषष्टिशरावकाः। शूर्पाभ्यां च भवेद् द्रोणी वाही गोणी च सा स्मृता ।।
द्रोणीचतुष्टयं खारी कथिता सूक्ष्मबुद्धिभिः। चतुःसहस्रपलिका षण्णवत्यधिका च सा ।।
पलानां द्विसहस्रं च भार एकः प्रकीर्तितः। तुला पलशतं ज्ञेयं सर्वत्रैवैष निश्चयः ।।

(शा. सं. प्र. ख. १.१५-३२)

1. According to the Wise, thirty *paramāṇus* (atums) constitute one *trasareṇu* and its synonym is *vaṃśī*. When a beam of sun-rays comes to a dark room through a hole or window, the suspended particle seen in this beam of rays called *vaṃśī*.
2. Six *vaṃśīs* constitute one *marīci*.
3. Six *marīcis* constitute one *rājikā*.
4. Three *rājikas* constitute one *sarṣapa*.
5. Eight *sarṣapas* constitute one *yava*.
6. Four *yavas* constitute one *guñjā*.
7. Six *guñjās* constitute one *māṣa* which is synonymous with *hema* and *dhānyaka*.
8. Four *māṣas* constitute one *śāṇa* which is synonymous with *dharaṇa* and *ṭaṅka*.
9. Two *ṭaṅkas* constitute one *kola* and it is synonymous with *kṣudramo* (*ko*), *vaṭaka* and *draṅkṣaṇa*.

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10. Two *kolas* constitute one *karṣa* and its synonyms are *pāṇimānikā, akṣa, picu, pāṇitala, kiñcitpāṇi, tinduka, ṣoḍaśikā, karamadhya, haṃsapada, suvarṇa, kavalagraha* and *udumbara.*
11. Two *karṣās* constitute one *ardha pala* and its synonyms are *śukti* and *aṣṭamika.*
12. Two *śuktis* constitute one *pala* and its synonyms are *muṣṭi, āmra, caturthikā, prakuñca, ṣoḍaśī and bilva.*
13. Two *palas* constitute one *pṛasṛti* or *prasṛta.*
14. Two *prasṛitis* constitute one *añjali*. Its synonyms are *kuḍava, ardha-śarāvaka* and *aṣṭamāna.*
15. Two *kuḍavas* constitute one *mānikā*. Its synonyms are *śarāva* and *aṣṭapala.*
16. Two *śarāvas* constitute one *prastha.*
17. Four *prasthas* constitute one *āḍhaka*. Its synonyms are *bhājana, kaṃsa, pātra* and *catuḥ-ṣaṣṭi-pala.*
18. Four *āḍhakas* constitute one *droṇa*. Its synonyms are *kalaśa, nalvaṇa, armāṇa, unmāna, ghaṭa and rāśi.*
19. Two *droṇas* constitute one *śūrpa*. Its synonyms are *kuṃbha* and *catuḥ-ṣaṣṭi-śarāvaka.*
20. Two *śūrpas* constitute one *droṇī*. Its synonyms are *vāha* and *goṇī.*
21. Four *droṇīs* constitute one *khārī*. It is equivalent to 4096 *palas.*
22. Two thousand *palas* constitute one *bhāra.*
23. One hundred *palas* constitute one *tula.*

भाषटङ्काक्षबिल्वानि कुडवः प्रस्थमाढकम् । राशिर्गोणी खारिकेति यथोत्तरचतुर्गुणाः ।।

(शा. सं. प्र. ख. १.३३)

Māṣa, ṭaṇka, akṣa, bilva, kuḍava, prastha, āḍhaka, rāśi, go(au)ṇī and *khāri* - each one of these succeeding units are four times of the preceding ones i.e. four of the preceding ones constitute one unit of succeeding ones.

Weight of Wet and Dry Substances

गुञ्जादिमानमारभ्य यावत्स्यात्कुडवस्थितिः । द्रवार्द्रशुष्कद्रव्याणां तावन्मानं समं मतम् ।।

(शा. सं. प्र. ख. १.३३-३४)

From *guñjā*, upto *kuḍava*, both the wet and dry substances are to be taken in similar quantities. By implication, if a substance is described in the text to be taken in the quantity of one *guñjā* or multiple thereof, then the substance is to be taken according to the prescribed weight irrespective of the physical nature of the drug (whether it is wet or dry). This rule is to be followed upto *kuḍava* or multiple thereof.

If a wet substance or a liquid is described to be taken in the quantity of *prastha* or multiple thereof, then in actual practice such substances are to be taken in double the quantity. (However, in the case of dry substances doubling of the quantity is not necessary. Doubling of the quantity of wet and liquid substances is necessary because of their moisture content. If in a recipe, such wet drugs are added in double the quantity, then therapeutically they will as effective as the dry drugs). If a drug is mentioned in the text to be used in the quantity of *tulā*, then it should never be doubled even if it is a wet drug.

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Size (Volume) of Kuḍava

मृद् वृक्षवेणुलोहादेर्भाण्डं यच्चतुरङ्गुलम्। विस्तीर्णं च तथोच्चं च तन्मानं कुडवं वदेत्।।

(शा. सं. प्र. ख. १.३५-३६)

The unit of *kuḍava* is used for weight and volume of measurement. For the latter, a cylindrical container is prepared of mud, wood, bamboo, iron. etc. This container should have internal diameter and height of four *aṅgulas* (finger breadth = about 1/2 inch) each.

Need for Reducing Dose

During the present *kali* age, human beings have low power of digestion, they are of short stature and they have low vitality. Therefore, the appropriate dose of medicines for the present day human beings, as suggested by the wise physicians, will be described (hereafter).

Kāliṅga Type of Weights and Measurements

यवो द्वादशभिर्गौरसर्षपैः प्रोच्यते बुधैः। यवद्वयेन गुञ्जा स्यात्त्रिगुञ्जो बल्ल उच्यते।।
माषो गुञ्जाभिरष्टाभिः सप्तभिर्वा भवेत्क्वचित्। स्याच्चतुर्माषकैः शाणः स निष्कष्टङ्क एव च।।
गद्याणो माषकैः षड्भिः कर्षः स्याद् दशमाषिकः। चतुष्कर्षैः पलं प्रोक्तं दशशाणमितं बुधैः।
चतुष्पलैश्च कुडवं प्रस्थाद्याः पूर्ववन्मताः।। (शा. सं. प्र. ख. १.३३)

Hereafter, the *kāliṅga* type of weights and measurements will be described :

1. Twelve *gaura sarṣapa* (white mustard seed) constitute one *yava* (grain of barley).
2. Two *yavas* constitute one *guñjā* (seed of *Abrus* precatorius)
3. Three *guñjās* constitute one *balla*.
4. Eight or seven *guñjās* constitue one *māsa*.
5. Four *māṣas* constitute one *śaṇa*. Its synonyms are *niṣka* and *ṭaṅka*.
6. Six *māṣas* constitute one *gadyāṇa*.
7. Ten *māṣas* constitute one *karṣa*.
8. Four *karṣas* constitute one *pala*. It is equivalent to ten *śāṇas*.
9. Four *palas* constitute one *kuḍava*.

Subsequent units of weights and measurements are in accordance with the *Māgadha* school.

Thus, ends the explanation of *kāliṅga* type of weights and measures.

It shoud be noted that liquids, like solids, are measured by weights.

There is one pecularity about liquid measures which should be noticed. When one *Prastha* or more of a liquid is directed to be used in the preparation of a medicine double the quantity is actually taken. Thus if it stated in any text that of solid drugs take one seer, of oil take two seers, of milk take three seers, and of water take four seers, the measures to be actually taken are one seer of solid, four seers of oil, six seers of milk, and eight seers of water. For measures below a *prastha* or two seers, the quantities of liquid are not doubled.

Tables of Weights and Measures According to Māgadha & Kālinga Schools

(A) *Māgadha* School

(Weights and measures which were prevalent in the ancient state of *Māgadha*).

30 *paramāṇus* (atoms) 1 *trasareṇu (Vaṃśī)*

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6 *vaṃśīs*	1 *Marīci*
6 *Marīcis*	1 *Rājikā*
3 *Rājikās*	1 *Sarṣapa*
8 *Sarṣapas*	1 *Yava* (weight of barley grain)
4 *Yavas*	1 *Guñjā*
6 *Guñjās (raktikas)*	1 *Māṣa*
4 *Māṣas*	1 *Śāṇa*
2 *Taṅkas*	1 *Kola*
2 *Kolas*	1 *Karsa*
2 *Karṣas*	1 *Ardhapala*
2 *Śuktis*	1 *Pala*
2 *Palas*	1 *Prasṛti*
2 *Prasṛtis*	1 *Añjali (kuḍava)*
2 *Kuḍavas*	1 *Mānikā (śarāva)*
2 *Śarāvas*	1 *Prastha*
4 *Prasthas*	1 *Āḍhaka*
4 *Āḍhakas*	1 *Droṇa*
2 *Droṇas*	1 *Śūrpa*
2 *Śūrpas*	1 *Droṇī*
4 *Droṇis*	1 *Khāri* (equivalent to 4096 palas)
2000 Palas	1 *Bhāra*
100 palas	1 *Tulā*

(B) *Kāliṅga* School (Weights and measures prevalent in the ancient state of *Kāliṅga*)

2 *Gaura Sarṣapa*	1 *Yava*
2 *Yavas*	1 *Guñjā*
3 *Guñjas*	1 *Balla*
8 *Guñjās*	1 *Māṣa*
4 *Māṣas*	1 *Sāṇa (syn = niṣka and ṭaṅka)*
6 *Māṣas*	1 *Gadyāṇa*
10 *Māṣas*	1 *Karṣa*
4 *Karṣas*	1 *Pala*
4 *Palas*	1 *Kuḍava*

Note : Subsequent units of weights and measures are in accordance with *Māgadha* School.

Table of weights and measures described in Āyurvedic Classics and their metric equivalents adopted by the Āyurvedic Pharmacopoeia committee.

The following table of metric equivalents of weights and measures, linear measures and measurement of time used in the *Āyurvedic* classics have been approved by the *Āyurvedic Pharmacopoeia* committee in consultation with Indian Standards Institution.

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Weights and Measures

1 Ratti or Guñjā		*125 mg.*
8 Rattis or Guñjās	*- 1 Māṣa*	*1 g.*
12 Māṣas	*- 1 karṣa (Tola)*	*12g.*
2 Karṣas (Tolas)	*- 1 Sukti*	*24 g.*
2 Śuktis	*- 1 Palam*	*48 g.*
(4 Karṣas or 4 Tolas)		
2 Palams	*- 1 Prasṛti*	*96 g.*
2 Prasṛti	*- 1 Kuḍava*	*192 g.*
2 Kuḍavas	*- 1 Mānika*	*384 g.*
2 Mānikas	*1 Prastha*	*768 g.*
4 Prasthas	*1 Āḍhaka*	*3 kg. 73g.*
4 Āḍhakas	*1 Droṇa*	*12kg. 288g.*
2 Droṇas	*1 Sūrpa*	*24kg. 576g.*
2 Sūrpas	*1 Droṇi (Vāhi)*	*49kg. 152g.*
4 Droṇis	*1 Khari*	*196kg. 608g.*
1 Palam		*48 g.*
100 Palams	*1 Tula*	*4kg. 800g.*
20 Tulas	*1 Bhāra*	*96 kg.*

In the case of liquids, the metric equivalents would be the corresponding litre and milliliter.

Linear Measures

'Classical Unit'	*'Inches'*	*'Metric Equivalents'*
Yavodara	*1/8 of 3/4"*	*0.24 cm.*
Aṅgula	*3/4"*	*1.95 cm.*
Bitahasti	*9"*	*22.86 cm.*
Aratani	*10 1/2"*	*41.91 cm.*
Nṛpahasta (Rājahasta)	*22"*	*55.88 cm.*
Vyaṁ	*72"*	*182.88 cm.*

Measurement of Time

'Classical Unit'		*'Equivalent (in hrs. minutes & seconds)'*
2 Kṣaṇa	*1 Lava*	
2 Lavas	*1 Nimesa*	
3 Nimeṣas	*1 Kaṣṭha*	*4.66 Seconds*
1 Ghaṛi		*24 Minutes*
30 Kaṣṭhas	*1 Kala*	*2 Minutes (20 seconds)*
20 Kala + 3 Kaṣṭhas	*1 Muhūrta*	*48 Minutes*

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30 Muhūrtas	*1 Ahorātra*	*24 Hrs.*
15 Ahorātras	*1 Pakṣa*	*15 Days*
2 Pakṣas	*1 Māsa*	*30 Days/One month*
2 Māsa	*1 Ritu*	*60 Days/Two months*
3 Ritu	*1 Ayana*	*6 Months*
2 Ayana	*1 Samvatsara*	*12 Months/1 Year*
5 Samvatsara	*1 Yuga*	*5 Years*
1 Ahorātra of Devas		*1 Year*
1 Ahorātra of Pitarasa		*1 Month*

Pāschatya Mana Paribhāṣa
(Weights and Measures According to Modern)

There are two systems of weights and measures (a) the imperial system, (b) the metric system ,with which the pharmacist must be familiar. The imperial system is an old system based on arbitrary and unrelated units eg. Grains, drachms, ounces and gallons whereas the metric system or decimal system is based on related and rationally derived units eg. milligrams, grams, centimeters, meters, millimeters, litres, etc. Because of its easier calculation greater accuracy and flexibility and use in other sciences, now a days this is the most widely used system by official agencies.

Metric System

Standard unit of measures of mass (weight) is kilogram and all other measures of mass are derived from kilogram.

1 Kilogram (Kg.)	1000 g.	
1 Hectogram (Hg.)	100 g.	
1 Decagram (deg)	10 g.	
1 Gram (gm)	1 g.	
1 Decigram (dg)	0.01 g.	100 mg.
1 Centigram (cg)	0.001 g.	10 mg.
1 Milligram (mg)	0.001 gm	1 mg.
1 Microgram (mcg)	1/1000 mg.	

Domestic Measures

1 drop	1 minim	0.06 ml
1 tea spoonful	1 fl. drachm	4 ml
1desert spoonful	2 fl. drachm	8 ml
1 table spoonful	4 fl. drachm	15ml
2 table spoonful	1 fl. Ounce	30 ml
1 wine glassful	2 fl. Ounce	60 ml
1 tea cupful	4 fl. Ounce	120 ml
1 tumblerful	8 fl. Ounce	240 ml

Conversion Factors (For all Practical Purposes)

1 grain	64.8 mg	65 mg.

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1 drop	1 minim	0.06 ml
1 fl. Ounce	29.57 ml	30 ml
1 gram	15.4 gr	15gr
1 milligram	1/65 gr	1/65gr
1 millilitre	16.23 minim	15 m
1 litre	33.8 fl ounce	
1 kilogram	2.2 pound	

Imperial System

Imperial system is divided into two systems.

Avouirdupois system : According to this system the standard unit for weighting is pound and all other measures of mass are derived from pound. It is represented by lb.

Apothecaries System

It is also known as troy system. The standard weight in this system is grain.

20 grains	1 scruple
60 grans	1 drachm
480 grains	1 ounce
8 drachms	1 ounce
12 ounce	1 pound
5760 grains	1 pound

Measures of Capacity

Standard units for capacity are same in avoirdupois as well as apothecaries system. The standard unit is gallon and all other measures of capacity are derived from gallon.

1 gallon	160 fluid ounces	
1/4th of a gallon	1 quart	40 fl ounce
1/8th of a gallon	1 pint	20 fl ounce
1/160th of a gallon	1 fl. Ounce	
1/8th of a fl. Ounce	1 fl drachm	
1/60th of a fl. drachm	1 minim	
1 fluid ounce	480 minim	
1 fluid drachm	480/8	1 minim

Abbreviations Commonly Used in Measures of Capacity

Latin Name	Symbol	English Name	Equal To
Minimum	m	minim	1 minim
Fluidrachma	fl.	fl. drachm	60 minim
Fluidunicia	fl.	fl. ounce	480 minim
Octaius	o	pint	20 fl. ounces
Congius	c	gallon	160 fl.ouinces

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Dravya Sangrahaṇa (Collection of Drug)

According to Dry and Wet State

गुडूची कुटजो वासा कूष्माण्डंच शतावरी। अश्वगन्धा सहचरी शतपुष्पा प्रसारिणी।
प्रयोक्तव्या सदैवार्द्रा द्विगुणा नैव योजयेत्।। (शा. सं. प्र. ख. १.४५-४६)

On all occasions the drugs which are dry and fresh should be selected. In case of green *drugs*, they should be taken in double the prescribed quantity. But *Guḍūcī, Kuṭaja, Vasā, Kuṣmāṇḍa, Śatāvarī, Aśwagandhā, Sahacarī, Śatpuṣpā* and *Prasāraṇī* should always be used in green state but need not be taken in double the prescribed quantity.

Accordidng to Time

नवान्येव हि योज्यानि द्रव्याण्यखिलकर्मसु। विना विडङ्गकृष्णाभ्यां गुडधान्याज्यमाक्षिकैः।।
(शा. सं. प्र. ख. १.४४)

On all occasions fresh *drugs* only should be used for making recipes, except *viḍaṅga, kriṣna jīra, guḍa, dhānya, ghṛta* and *mākṣika* (*madhu*) (which are therapeutically more effective when used after preservation for some time).

Restrictions should be followed by Physician while collecting the drug

गृह्णीयात्तानि सुमनाः शुचिः प्रातः सुवासरे।।
आदित्यसंमुखो मौनी नमस्कृत्य शिवं हृदि। साधारणधराद्रव्यं गृह्णीयादुत्तराश्रितम्।।
वल्मीककुत्सितानूपश्मशानोषरमार्गजाः। जन्तुवह्निहिमव्याप्ता नौपध्यः कार्यसिद्धिदाः।।
(शा. सं. प्र. ख. १.५६-५८)

The Physician who is pure in mind and clean in body should collect the herbs during sunshine praying to lord *Shiva* in silence, herbs growing in northern direction are to be collected. Herbs growing on dirty places, marshy land, burial ground, salty soil, roads and those which have been infected with worms, effected by fire and snow will not yield the desired effect.

Season for Drug Collection

शरद्यखिलकार्यार्थं ग्राह्यं सरसमौषधम्। विरेकवमनार्थं च वसन्तान्ते समाहरेत्।।
(शा. सं. प्र. ख. १.५९)

Śarad ṛitu (October, November) is the best time for collection of *herbs* for all types of preparations. But for herbs which are meant for *vamana* and *virecana,* the best time is the end of *vasant ṛtu* (February – March).

अतिस्थूलजटा याः स्युस्तासां ग्राह्यास्त्वचो बुधैः। गृह्णीयात्सूक्ष्ममूलानि सकलान्यपि बुद्धिमान्।।
न्यग्रोधादेस्त्वचो ग्राह्याः सारः स्याद् बीजकादितः। तालीशादेश्च पुष्पाणि फलं स्यात्त्रिफलादितः।।
धातक्यादेश्च पुष्पाणि स्नुह्यादेः क्षीरमाहरेत्।
(शा. सं. प्र. ख. १.६०-६२)

The root bark is to be collected in case of big roots whereas in case of tender ones the entire root system is collected: in case of big trees like *Nyagrodha* etc., their outer bark is to be collected: in case of trees like *Bījaka* etc. their pith, in case of *Talisa* etc., their leaves: in case of *Triphalā* etc. their fruits: in case *dhātaki* etc. their flowers and in case of *snuhi* etc. their sap.

आग्नेया विन्ध्यशैलाद्याः सौम्यो हिमगिरिर्मतः। अतस्तदौषधानि स्युरनुरूपाणि हेतुभिः।।

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अन्येष्वपि प्ररोहन्ति वनेषूपवनेषु च । (शा. सं. प्र. ख. १.५५-५६)

Herbs grown in the Vindhya mountains are āgneya (heat producing) while those growing in the *Himalayas* are *saumya* (coolant), hence they should be so choosen as are suited to the person..Plants growing in other forests will have the qualities of the place.

Particular part of the plant in that particular season will possess more active principles. Hence, different *Ācāryas* were explained about collection of different parts of plants in different seasons.

Prayojyāṅga (part used)	*Caraka*	*Suśruta*	*Raja Nighaṇṭu*
Mūla	*Grīṣma or Śiśira*	*Prāvṛt*	*Śi´sira*
Patra	*Varṣa, Vasanta*	*Varṣa*	*Śiśira*
Śākha	*Varṣa, Vasanta*	-	-
Puṣpa	*Yadhāṛtu*	-	*Vasanta*
Phala	*Yadhāṛtu*	*Grīṣma*	*Vasanta*
Sāra	*Hemanta*	*Vasanta*	-
Twak	*Śarat*	*Śarat*	-
Kanda	*Śarat*	*Śarat*	*Hemanta*
Kṣīra	*Śarat*	*Hemanta*	-
Pancāngas	-	-	*Śarat*

According to *Cakrapāṇi datta* the *uṣnavīrya dravya mūla* should be collected in *Grīṣma ṛtu*, where as *śīta vīrya dravya mula* should be collected in *Śiśira ṛtu.*

According to *Karma, Pañcabhūta ādhikyata* of the drugs and their collection in particular season.

Karma	*Pañcabhūta Ādhikyata*	*Ṛtu*
Vamana	*Agni + Āakāśa*	*Vasanta*
Virecana	*Prthvi + Jala*	*Vasanta*
Vasti, Naśya	-	*Sarat*

Jāngama Dravya Sangrahana

Dravya	*Kāla/vayas (age)*
Rakta, Roma, Nakha	*Prauḍha Vayas (Adult age)*
Kṣīra Mūtra, Purīṣa	After digestion of food

Phala (Fruit) Collections

All the fruits should be collected when they are ripened properly expect *Bilva Phala* which is supposed to be collected in unripened *(apakwavasta)* condition only.

Dhanya Collections

Dhānya should be collected when it is not very new and when it is not too old.

All these restrictions were explained by acaryas because of these below mentioned reasons :

The usual time for collection of leaves is when the flowers are just beginning to expand, or the flowering just arriving at its height.

At this time it is reasonable to assure that the leaves are in the most healthy state and contain an optimum of the products of the plant metabolism and one can obtain the most desirable therapeutic action. As moisture decreases the constituents, they are collected in dry weather, collection of flowers

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must always be made in fine, dry weather, because the petals which are damp when gathered become badly discolored during drying.

Roots and rhizomes are usually collected when their tissues are fully stored with reserved foods, it being assumed that medicinal constituents will be almost abundant during this season.In temperate regions autumn is therefore the season for collection. The time for collection of bark is usually spring or early summer, when the sap is rising in the stem and the cambium is active and therefore, more easily forms than at other seasons. Galls are collected after the escape of gallwasp.

Substitutes

व्रजाभावे तु वैक्रान्तं स्वर्णाभावे तु माक्षिकम्। हेममाक्षिकजं सत्त्वं मृतहेमसमं गुणैः ।।
विमलमाक्षिकं ज्ञेयं ध्रुवं रजतवद्गुणैः। मुक्ताभावे क्षिपेन्नूनं मुक्ताशुक्ति च तद्गुणम् ।।
अभावेऽभ्रकसत्त्वस्य कान्तलोहं च योजयेत्। कांताभावे तीक्ष्णलोहं इत्युक्तं रसदर्पणे ।।
अभावे मधुनो योज्यो गुडो जीर्णश्च तद्गुणः। सिताभावे भवेत् खण्डं शाल्यभावे च षष्टिकाः ।।
असंभवे तु द्राक्षायाः प्रदेयं काश्मरीफलम्। वृक्षाम्लं न भवेत्तत्र दाडिमाम्लं प्रयोजयत् ।।
वेतसाम्लस्य चाभावे हरिमन्थाम्लमादिशेत्। अभावे चन्दनस्यापि मेलयेद्रक्तचन्दनम् ।।
अभावे सति पित्तानां रसाधैर्भावनाविधौ। विषमुष्टिकषायेण तद्गुणश्चैव भावयेत् ।।

(Iatro-chemistry of *Āyurveda-Rasaśāstra,* chapter-I.42-48)

1. The physician may use *Vaikrānta* in the place of *Vajra* (diamond) and *Svarṇa mākṣika* in the place of *Svarṇa* (gold).
2. The *sattva* (essence) of *Svarṇa mākṣika* is similar to *Svarṇa bhasma* in properties. Similarly, the *satva* of *Vimala mākṣika* is certainly like silver in properties.
3. If *Muktā* (pear) is not available, then in its place *Muktā-śukti* (pearl oyester), which has similar properties, may be used.
4. If *Abhrak-sattva* is not available, then in its place *kānta lauha* may be used in a recipe.
5. According to the text *'Rasa-Darpaṇa'* if *Kānta-lauha* is not available, then in its place *tikṣṇa-lauha* may be used.
6. If honey is not available, then old jaggery having similar properties may be used in its place in a recipe.
7. If sitā (crystal sugar) is not available, then in its place *khaṇḍa* (a type of brown sugar) may be used in the recipe.
8. If *śāli* type of rice is not avialable then in its place *ṣaṣṭika* type of rice may be used.
9. If *drākṣā* is not available, then in its place, *kāśmari*-fruit may be used.
10. If *vṛkṣāmla* is not available, then in it place sour variety of *dāḍima* may be used.
11. If *vetasāmla* is not available, then in its place *harimanthāmla* may be used.
12. If white variety of *candana* is not available then in its place red variety of *candana* should be added to a recipe.
13. If the ingredients of a recipe are described to be impregnated with juices and biles of animals, and if such biles (*pitta*) are not available, then in their places, the recipe should be impregnated with the decoction of *viṣamuṣṭi* which has similar properties.

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मेदा-जीवक-काकोलीद्वंद्वाभावे प्रयोजयेत् । यष्टीविदार्यश्वगंधाबलावरीवाराहीकान् ।।

(Iatro-chemistry of *Āyurveda-Rasaśāstra*, chapter-I.49)

If *meda, mahā-medā, jīvaka., ṛṣabhaka, kākolī,* and *kṣīra- kākoli* are not available, then in their places *yaṣṭī, vidārī, aśvagandhā, balā, śatāvarī* and *vārāhīkanda* should respectively be used.

फलमाममपुष्टं च त्यजेद्बिल्वादृते सदा । द्राक्षाबिल्वशिवादीनां फलं शुष्कं गुणोत्तरम् ।।

(Iatro-chemistry of *Āyurveda-Rasaśāstra*, chapter-I.50)

The Physician should always discard fruits which are unripe and immature excepting *Bilva* (in which latter is more useful when it is unripe and immature). Fruits of *drākṣa, bilva, śivā,* etc., are more useful when these are dry.

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Chapter 18

AUṢADHA KALPANĀ

The raw drug has to be purified and transformed into a useful and agreeable form, so that it can be used as a medicine.

Śodhana (purification) is the first process, which is applied for removal of physical and chemical impurities of the drug. It also lessens or eliminates the toxic effect of such drugs as in case of aconite etc. Particularly for minerals and poisons it is a must. Then this purified drugs are converted into *Auṣadha kalpanā.*

There are patients who are averse to the taking of the *swarasa* (juice) of a *drug,* some others in *Kalka* (paste) form. Similarly, there are certain diseases where a *Auṣadha* (medicament) is required to be administered in a particular form. For example, *kwatha (*decoctions) form a special therapy in the treatment of fever. So it is necessary that the medicaments are amenable to preparations according that the medicaments are amenable to preparations according to various pharmaceutical processes, Moreover, medicaments should be potent and free from infections and dampness. Hence *Ācāryas* mentioned different types of *Auṣadha Kalpanās.*

Kalpanās can be broadly classified in to following groups.

Kalpanā

- *Auṣadha kalpanā*
  - *Primary Kalpanās*
    - *Pañcavidha kaṣāya kalpanā*
  - *Secondary Kalpanās*
    - *1. Sneha kalpanā*
    - *2. Sandhāna kalpanā*
    - *3. Other kalpanās—*
      - *Cūrṇa, Vaṭī, Varti, Guggulu*
      - *Pānaka, Śarkara, A valeha, Rasakriya*
      - *Khaṇḍa pāka, Lehya, Phāṇita, Kṣāra,*
      - *Arka, Satwa*
      - *Lākṣārasa, Pramadya, Lavaṇa, Masi,*
      - *Kṣīrapāka, Bāhya kalpanā, Netra kalpanā*
      - *Mukha kalpanā, Nāsa kalpanā,*
      - *Dhūmapāna kalpanā*
      - *Vasti kalpanā, Ayaskṛti etc.*
- *Āhāra kalpanā*
  - Maṇḍa, Peya, Vilepi
  - *Takra, Yūṣa,*
  - *Vāṭyodanam etc.*

Auṣadha Kalpanā also can be classified into different types on the basis of its mode of administration, its effect, nature of its formula and its physical form.

Auṣadha Kalpanā

- *Bāhya Kalpanā* (External application)
- *Kalpanā* Prayoga
- *ment for abhyantara* (Internal administration)

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E.g. lepa, malahara etc. E.g. Vaṭī, avalehya etc.

Auṣadha Kalpanā

- *Urjaskara* (Restoration of vitality)
- *Rogaghna* (Removal of disease)
- *Apunarbhava* (Prevention of recurrence)

Auṣadha Kalpanā

- *Kāṣṭauṣadhi* (Predominantly Plant drugs are used for preparation)
- *Rasauṣadhi* (Predominantly metals and minerals are used for preparation)

Āyurvedic dosage form

- Solid dosage form E.g. *Guṭikā, vaṭī etc.*
- Semi solid dosage form E.g. *Avalehya, pāka, lepa, Ghṛta etc.*
- Liquid dosage form E.g. *Ariṣṭa, Āsava, Arka, Taila, Kwātha* etc.
- Powder dosage form E.g. *Cūrṇa, lavaṇa, pisti* etc.

Pañca Vidha Kaṣāya Kalpanā

The word *kaṣāya* is formed by the combination of कषू+आय and the meaning of this word is that the form of crude drug is converted by destroying its original form in to another form (*Kalpanā*). by some pharmaceutical process is (E.g. *mardana. kuṭṭana. bhāvana.* etc.) in to consumable form (medicine).

For example. the *nimba patras* are converted by pounding in to *kalka* (*paste form*) this *kalka* once it is produced it has to be used as medicine but it can't be reconverted into original *nimba patras*. Hence the phenomena is that. without destroying the original form of the crud drug. the medicine form of same drug can not be produced.

कण्ठस्य कषणात् प्रयो रोगाणां वाऽपि कषर्णात् । कषायशब्दः प्राधान्यात् सर्वयोगेषु कल्प्यते ।।

(काश्यप सं., खिल ३२९)

The *kaṣāya śabda* will be produced, when tongue causes obstruction to the *kaṇṭa srotus*. Same *manner kaṣāya* will obstruct the disease process. Because of the importance of *kaṣāya sabda* it can be combined with other yogas. E.g. *Swarasa kaṣāya, Kalka kaṣāya. Hima kaṣāya. Phāṇta kaṣāya.*

कषायो रसभेदे स्यादङ्गरागे विलेपने । निर्यासे च कषायोऽथ सुरभौ लोहितेन्यवत् ।। (विश्वकोष)

कषायः सुरसौ रस ..... । रागवस्तुनि निर्यासे क्रोधादिषु विलेपने ।। (हेमः)

The *kaṣāya śabda* is having the following *paryāya padas* (*synonyms*) : *Rasabheda, Aṅgarāga, Vilepana. Niryāsa, Surabhi, Lohita, Rāgavastu* etc.

Pañca Kaṣāya Yoni (Sources of five formulae/recipes/drug formulations)

पञ्च कषाययोनय इति मधुरकषायः अम्लकषायः । कटुकषायः तिक्तकषायः कषायकषायश्चेति तन्त्रो संज्ञा ।।

(च. सू. ४.६)

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विलीनरूपत्वादेवं न सम्भवतीति शृतकल्पनाया अप्यसम्भवः। एवं शीत-फाण्ट-योरप्यनेनैव न्यायेनासम्भवः इत्युक्तं लवणवर्ज्या रसाः कषाय योनय इति। (अष्टाङ्गहृदय, कल्प. ६.८ की टीका अरुणदत्तः)

पञ्च कषाययोनयोऽभिधीयन्ते। मधुरश्चासौ कषायश्चेति मधुरकषायः एवं शेषेष्वपि। तन्त्रे संज्ञेत्यनेन लवणरसं वर्जयित्वा मधुरादयो रसाः कषायसंज्ञाय व्यवह्रियन्ते इत्ययं स्वतन्त्रसमय इति सूचयति, नात्र परतन्त्रव्यवहार इति। अथ किमर्थं पुनराचार्येण कषायसंज्ञाप्रणयने लवणस्य मधुरादेरिव गुणादिभिरुपदिष्टस्य तथा प्रयोगेषु चित्रकगुटिकादौ 'द्वौ क्षारौलवणाणि च' (च. चि. १५) इत्यादिनोद्दिष्टस्य रोगभिषग्जितीय (च.वि. ८) च स्कन्धेनोपदिष्टस्य रसाधिकारेषु च तेषु तेषु मधुरादिवदुपदिष्टस्य परित्यागः क्रियते? उच्यते-कषायसंज्ञेयं भेषजत्वेन व्याप्रियमाणेषु रसेष्वाचार्येण निवेशिता। अत्र च केवलस्य लवणस्य प्रयोगो नास्ति, मधुरादीनां तु केवलानामपि प्रयोगाऽस्ति लवणं तु द्रव्यान्तरसंयुक्तमेवोपयुज्यते। मधुरादिषु स्वरसकल्कादि लक्षणा कल्पना सम्भवति, न लवणे। यतो न तावल्लवणस्य स्वरसोऽस्ति, कल्कोऽपि द्रव्यस्य द्रवेण पेषणात् क्रियते, तच्च न सम्भवति लवणे, लवणं हि पानीययोगात् पानीयमेव भवति, यद्यपि कल्कस्यैव भेदश्चूर्ण, चूर्णता च लवणस्य सम्भवति तथाऽपि लवणस्य चूर्णरूपता न पूर्वस्मादचूर्णरुपात् किञ्चिच्छक्ति विशेषमापादयति, शक्तिविशेषकल्पनार्थं च कल्पना क्रियते इत्युत्तरत्र प्रतिपादयिष्यामः तस्मच्चूर्णत्वमपि लवणस्य कल्पनकल्पनमिवः, शृतशीतफाण्टकषायास्तु द्रव्यस्य कार्त्स्न्येनानुपयोज्यस्य तत्तत्संस्कारवशाद्द्रवेषु द्रव्यस्य स्तोकावयवानुप्रवेशार्थमुपदिश्यन्तेः, लवणे चैतन्न सम्भवति, लवणं हि द्रव सम्बन्धे सर्वात्मनैव द्रवमनुगतं भवति; तस्माल्लवणं पृथक् प्रयोगाभावात् कल्पनाऽसम्भवाच्चाचार्येण कषायसंज्ञाप्रणयने निरस्तमिति न निष्प्रयोजनेयमाचार्यप्रवृत्तिः। (चरक सू. ४.६ टीका चक्रपाणिः)

लवणस्य तु स्वरसकल्पनायोगो न सम्भवात सदैव शुष्करूपत्वात् । क़ल्ककल्पनाऽपि न सम्भवति, यतो यद्द्रव्यं द्रवेण सिक्तं पिण्डीभवति न तु विलीयते तत् कल्क संज्ञामासादयति । तथा यद्द्रव्यं क्वाथयित्वा जलादुध्रियते, द्रव्यावयवास्तूदकमनुप्रविशन्ति तत्रौव ट्ठमत्रतकल्पना । लवणस्य तु विलीनरूपत्वादेवं न सम्भवतीति शृतकल्पनाया अप्य सम्भवः । एवं शीतफाण्टयोरप्यनेनैव न्यायेनासम्भवः इत्युक्तं लवणर्ज्या रसाः कषाय योनय इति । (अष्टाङ्गहृदय, कल्प, ६, ८ टीका अरूणदत्तः)

Five sources of Kaṣāyas (Formulae/Recipes/Drug Formulations) namely.

1. *Madhura Kaṣāya* 2. *Āmla Kaṣāya*
3. *Kaṭu Kaṣāya* 4. *Tikta Kaṣāya*
5. *Kaṣāya Kaṣāya*

Among the *Ṣadrasas* (*Madhura, Āmla, Lavaṇa, Kaṭu, Tikta, Kaṣāya*), except *lavaṇa rasa* the drugs of rest of five *rasas* are considered as sources for *Kaṣāya.* Because by utilizing *Madhura* etc., five above mentioned *rasās, Kaṣāya* can be prepared, where as with *Lavaṇa rasa* alone it is not possible to prepare any *Kaṣāya,* because it is possible only when *Lavana rasa* is combined with other five *rasas.*

Another reason is that as *Ācārya Caraka* mentioned five pharmaceutical processes respectively, *Swarasa, Kalka, Sṛta, Śita* and *Phāṇṭa.* To prepare these *Pañcavidha Kaṣāya Kalpanās* also this *lavaṇa rasa* is not useful. The reasons are as follows :

By utilizing *lavaṇa* it is not possible to extract *Swarasa.* Because *lavaṇa* is available in dried form. Usually for extracting *swarasa* from any *dravya* it is to be converted into *Kalka* form by pounding with adding appropriate quantity of water. This *Kalka* is squeezed to get separate, *Sāra Bhāga* (i.e. *swarasa)* and *Kiṭṭa bhāga* (i.e. unwanted waste part). By this usual *swarasa* extraction method it is not possible to extract *swarasa* from *lavaṇa,* because after adding water, *lavaṇa* becomes into solution form and it can not be get separated into *Sāra Bhāga (Swarasa)* and *Kiṭṭa Bhāga* (unwanted waste part).

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Kalka will be made from any drug by two methods, i.e. wet drugs can be pounded and converted into paste form, or dried drug powder can be mixed with appropriate quantity of water and pounded into *kalka* form. By these two methods with *lavaṇa* it is not possible to make *Kalka,* because *lavaṇa* is always available in dried form, it would not become into paste by pounding. Only *lavaṇa* and if water is added to that, then it becomes into solution form and does not produces any *Kalka.*

Kwātha (decoction), Śīta (*Cold infusion*) and *Phāṇṭa* (*hot infusion)* in all these three *Kalpanās* water is used as a media and the main aim of these *Kalpanās* is that to extract the active principles (evidently water soluble) 'into water by heating or without heating. By doing so, *Sāra Bhāga* (active principles) of *dravya* will be dissolved in water and *Kiṭṭa Bhāga* (waste product) is thrown out after filtration. By this method, from *lavaṇa* it is not possible to separate the active principles into water media, because after mixing *lavaṇa* in water. *lavaṇa* completely get dissolves in water and forms solution, hence it is not possible to separate the *Sāra bhāga* and *Kiṭṭa bhāga* by these extraction methods from *lavaṇa.*

Because of all above mentioned reasons, preparations of *Kaṣāya* (extracts, formulae, recipes etc.) from *lavaṇa.* not being possible, usage and utility of *lavaṇa* individually being little. Hence *Ācāryās* might have excluded the *lavaṇa* and made five *Kaṣāya Yonies.*

Ācāryās explained first of all *pañcavidha kaṣāya kalpanā.* Which are the basic *kalpanā* for all the other *kalpanā.* e.g. For the preparation of *avalehya, sneha kalpanā* etc. *kalpanās* one are the another variety of *pañcavidha kaṣāya kalpanā* are essential.

Ācārya caraka mentioned Pañca Vidha Kaṣāya Kalpanā's as follows

पञ्चविधं कषायकल्पनमिति । तद्यथा–स्वरसः, कल्कः, शृतः, शीतः, फाण्टश्चेति । तेषां यथापूर्वं बलाधिक्यं, अतः कषायकल्पना व्याध्यातुरबलापेक्षिणी । न त्वयं खलु सर्वाणि सर्वत्रोपयोगीनि भवन्ति । (च. सू. ४.४)

1. *Swarasa* (juice), 2. *Kalka* (paste), 3. *Sṛta* (decoction), 4. *Śīta* (cold infusion), 5. *Phāṇṭa* (hot infusion).

The potentiality (*gurutva*) of the medicines of the preceding category is greater than the succeeding ones so these preparations should be prescribed with due regard to the strength of the patient and seriousness of the disease. All these preparations are not equally useful in all cases.

Ācārya Śāraṅgadhara also given same opinion like *Ācārya caraka* regarding *pañca Vidha Kaṣāya Kalpanā's* as mentioned below.

1. *Swarasa* (fresh juice), 2. *Kalka* (wet bolus), 3. *Kwātha* (decoction), 4. *Hima* (cold infusion), 5. *Phāṇṭa* (hot infusion).

These are mentioned as *pañcavidha Kaṣāya Kalpanās,* the succeeding one *laghu* (easily digestible) than the proceeding.

As stated above, the potentiality of the preparations is greater in the preceding ones in relation to the succeeding ones. It is, therefore, necessary to take into consideration the strength of the patient and the seriousness of the disease while prescribing these different categories of preparations. For example, when the patient is strong enough and the disease is equally serious, the *swarasa* preparation of the drug will be eminently useful; it will not be so when the patient is weak or the disease is of less serious type. In fact, there are several other factors including the personal likings or otherwise of the individual patient to be taken into account while prescribing these preparations. If the patient has got aversion to

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swarasa, this preparation will not be useful to him at all irrespective of the fact that he is strong enough and his disease is of serious nature. According to the science of medicine, a drug disliked by a patient is not be prescribed, in as much as it might instantaneously cause emesis or anorexia. Thus, prescription of these preparations is to be made with due regard not only/to the strength of the patient or seriousness of the disease but also to the suitability of the drugs in question, specially in ralation to the likes or dislikes of the patients.

Even the utility of different drugs lies in their different preparations. As it is mentioned that *maṇḍūkaparṇī* should be administered in *swarasa* (juice) form, *Yaṣṭimadhu* is to be taken with milk in *powder* (*cūrṇa*) form; *guḍūci* along with its root and flower is to be taken in *swarasa* (juice) form and *śaṅkhapuṣpi* in *Kalka* (paste) form.

Ācārya Kāśyapa concept regarding Kaṣāya Kalpanās

चूर्ण शीतकषायश्च स्वरसोऽभिषवस्तथा । फाण्टः कल्कस्तथा क्वाथो यथावत्तं निबोध मे ।।

(काष्यप, खि. ३/३४)

Cūrṇa, Śīta Kaṣāya, Swarasa, abhiṣava (*Madhya Kalpanā*), *Phāṇṭa, Kalka, Kwātha.*

Ācārya Kāśyapa mentioned *Auṣadha Kalpanā's* (*Seven Kaṣāya Kalpanā's*) seven in numbers and included *Abhiṣava* (*Madhya kalpanā*) and *Cūrṇa Kalpanā.*

The sequency of these *Kalpanā's* is not according to *guru* and *laghu guna's.*

Ācārya Suśruta concept regarding kaṣāya kalpanās

क्षीरं रसः कल्कमथः कषायः श्रृतश्च शीतश्च तथैव फाण्टम् ।
कल्पाः षडेते खलु भेषजानां यथोत्तरं ते लघवः प्रदिष्टाः ।। (संश्रुत, सू. ४४. ९१)

Ācārya Suśruta has mentioned *six kalpanā's* as follows :

Kṣīra, Rasa (*Swarasa*), *kalka, śṛta (kwātha)*, Śīta, Cūrṇa.

Each preceding one, more stronger than its succeeding.

Ācārya caraka has not included *cūrṇa* and *abhiṣava* (*madhya kalpanā*) in *pañca vidha kaṣāya kalpanā's,* because it might have considered that, *cūrṇa* as a *antargata kalpanā* (*Upakalpanā*) of *kalka* and *abhiṣava* as a *antargata kalpanā* of *śīta kaṣāya.*

Swarasa Kalpanā

Synonyms : *Rasa, swarasa, niryāsa*

स्वो रसः स्वरसः प्रोक्तः । (च. सू. ४)

The juice expressed from particular substance is called *swarasa* of that substance.

यन्त्रा निष्पीडिताद् द्रव्याद रसः स्वरस उच्यते । (च. सू. ४)

The juice extracted from a drug, pressed by a machine is known as *swarasa* (Pure juice, native juice or extract).

The rasa which is produced by compressing, e.g. *Drākṣa. Ikṣu. Āmalaki* etc., is called *swarasa. This'swarasa* can be combined with other *saṁśamana kalpanā's* and administered for the treatment of different diseases.

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सद्यः समुद्धृतात् क्षुण्णाद् यः यवेत् पटपीडितात् । स्वरसः स समुद्दिष्टः..... ।। (अ. ह. क. ६.९)

The juice taken out from a fresh green herb, well pounded and squeezed through a cloth is known as *swarasa.*

यस्मिन् दिने समुद्धृतं तस्मिन्नेव दिने प्रक्षाल्य क्षुण्णां पटपीडितश्च यद्द्रव्यं तस्य रसः स्वरसः । इति । (हेमाद्रि)

The green fresh drug should be collected on the same day. Then *swarasa* can be prepared by washing and pounding them, by squeezing and filtering through a clean cloth. The liquid which is produced is called *Swarasa.*

तत्रा सद्यः समुद्धृतः प्रक्षालितक्षुण्णस्य तान्तवनिष्पीडितस्य निर्यासः स्वरसः । (अष्टाङ्ग संग्रह क. ८. १०)

Immediately after the drug is collected, it should be washed, crushed and squeezed through a cloth. This is said to be *swarasa* or *niryāsa.*

आहृतात्तत्क्षणाकृष्टाद् द्रव्यात्क्षुण्णात् समुद्धरेत् । वस्त्रानिष्पीडितो यः स रसः स्वरस उच्यते ।। (शा. सं. मं. १.२)

The juice extracted from a fresh green drug by pounding it then squeezing through a cloth, is known as *swarasa* or *rasa.*

General procedure of swarasa preparation

Collect the fresh green wet drugs and make them into paste form by pounding. Then extract the juice by squeezing it with a cloth *or yantra,* thus obtained juice is called s*warasa.*

Anukalpanā in swarasa abhāva

चूर्णानामाढकमाढकमुदकस्याहोरात्रास्थितं मृदितपूतं स्वरसवत् प्रयोज्यम् । (स्वरसानामलाभे त्वयं स्वरसविधिः ।) (च. चि. १.२.१२)

If wet drugs are not available, then for the preparation *of swarasa* the following special methods should be adopted. The powder of the plant drug should be taken in the quantity of one *aḍhaka* in an earthen pot and to this one *aḍhaka* (same quantity) *of* water is added and kept for one *ahorātra* (24 hours), thereafter it should be squeezed by hand and filtered. The liquid that comes out after filtration can be used as *swarasa.*

कुडवं चूर्णितं द्रव्यं क्षिप्तं तद् द्विगुणे जले । अहोरात्रां स्थितं तस्माद्भवेद्वा रस उत्तमः ।। (वैद्यक परि. प्र.)

One *kuḍava* powder of a dry drug put in twice its quantity of water, kept over for a day and night, then filtered and obtained liquid is also called as *swarasa.*

आदाय शुष्कद्रव्यं वा स्वरसानामसम्भवे । जलेऽष्टगुणिते साध्यं पादशिष्टं च गृह्यते ।। (शा. सं. म. १.४)

In the case of drugs, which are very dry and which do not give out any juice, boiling them in eight times their quantity of water and reducing to a quarter can be also used as *swarasa.*

मधु श्वेता गुडं क्षारान् जीरकं लवणं तथा । घृतं तैलं च चूर्णादीन् कोलमात्रां रसे क्षिपेत् ।। (शा. म. १.६)

घृतं सितां गुडं क्षौद्रं कोलमात्रां रसे क्षिपेत् । लवणक्षारचूर्णानि योग्यमानानि दापयेत् ।। (श्री यादव जी)

Prakṣepa Dravya's of Swarasa

Madhu (honey), *śarkara* (sugar), *guḍa* (jaggery), *kṣāra* (*alklies*), *Jīraka, lavaṇa, ghṛta* (ghee),

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taila (oil) are any powder if required to be added should be one *kola* each in quantity (These should be mixed in *two tola* or *half pala* of *swarasa).*

Some of the common swarasa kalpanā's with their amayika prayoga

Name of the Swarasa	*Āmayika prayoga*
1. Amṛata Swarasa	Prameha
2. Dhāthrī Swarasa	Prameha
3. Vāsa Swarasa	Rakta pitta, kāsa, kṣaya, kāmalā
4. Triphalā swarasa, Dāruharidrā swarasa, Nimba swarasa, Guḍūcī swarasa	Kāmalā
5. Jambu, āmra, āmalaka swarasa	Raktātīsāra
6. Ārdraka swarasa	Vṛṣaṇa vāta, śwāsa-kāsa,aruci, pratiśyāya
7. Bījapūra swarasa	Pārśwa śūla, hṛcchūla, vasti śūla koṣṭa vāta
8. Satavari swarasa	Pittaja śūla.
9. Kumāri swarasa	Plīha vṛddi, apacī,
10. Alambuṣa (gorakhmuṇḍi) swarasa	Apacī, gaṇḍamāla, kāmala
11. Brāhmi, kūṣmāṇda vacā, Śaṅkha puṣpī swarasa	All types of unmāda.

Ārdraka Swarasa

आर्द्रकस्य रसः पीतः पुराणगुडमिश्रितः । अजाक्षीराशिनां शीघ्रं सर्वशोथहरो भवेत् ।। (भै. रत्ना. शोथे)

Apparatus required

Mortar, pestle and clean cloth

Drugs required

Ārdraka—quantity sufficient

Procedure

Collect completely developed *ārdraka*, clean it well and remove external layer and make it into paste form by pounding. Then keep the paste over the cloth and squeeze it till total liquid content is get separated from the *kalka,* the obtained juice is called *ārdraka swarasa.*

If *ārdraka swarasa* is kept in a container for some time, sedimentation of starch like substance at the bottom of the container takes place. While administering the *ārdraka swarasa,* it should be adminstred along with that sedimented portion :

Pharmacological Actions

Rasa	:	Kaṭu
Guṇa	:	Guru, tīkṣṇa, uṣṇa, rūkṣa
Vīrya	:	Uṣṇa
Vipāka	:	Kaṭu
Doṣaghnata	:	Vātakaphaśāmaka
Karma	:	Bhedani, dipana, rucya, jihwaśodhana, kaṇṭa viśodhana etc.

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Indications

Ārdraka swarasa mixed with honey relieves *vṛṣaṇa vāta, swāsa, kāsa, aruci* and *pratisyāya.*

Ārdraka swarasa, if it is taken along with *purāṇa guḍa or ajākṣīra,* all types of *śotha* will be relieved very quickly.

Mātra : 1/2 pala (24 gms).

Anupāna

Madhu, ajākṣīra, purāṇaguḍa, etc.

Tulasī Swarasa

Apparatus required

Mortar, Pestle and clean cloth

Drugs required

Tulasī—quantity sufficient.

Procedure

Take fresh and cleaned *Tuiasī leaves* and make them into paste form, with the help of mortar and pestle. Then keep the paste over the cloth and squeeze it and obtained liquid portion is called *Tulasī swarasa.*

Pharmacological Actions

Rasa	:	*Kaṭu, tikta*
Guṇa	:	*Laghu, Rūkṣa*
Vīrya	:	*Uṣna*
Vipāka	:	*Kaṭu*
Karma	:	*Dīpana, Kapha Vāta Śāmaka, Pittavardhaka.*

Indications

Swāsa, kāsa, hikka, pārśvaśūla, kuṣṭa etc.

Mātra : I to 2 tola

Puṭa Pāka Swarasa Vidhi

पुटपाकस्य मात्रोयं लेपस्याङ्गारवर्णता । लेपं च द्व्यङ्गुलं स्थूलं कुर्याद्वाङ्गुष्ठमात्राकम् ।।
काश्मरीवटजम्ब्वादिपत्रैर्वेष्टनामुत्तमम् । (वैद्यक परि० प्रदीप)
द्रव्यमार्द्र शिलापिष्टं शुष्कं वा सजलं ततः । गोलं विधाय वृक्षाणां पत्रैरावेष्ठयेद् दृढम् ।।
सूत्रोण बध्वा गोधूमपिष्टेन परिवेष्टयेत् । तत आर्द्रमृदालिप्त्वा गोमयाग्रौ प्रतापयेत् ।।
अङ्गारवर्णा च मृदं दृष्टूवा वह्ने समुद्धरेत् । ततो रसं वस्त्रापूतं पुटपाकं प्रदापयेत् ।।

(द्र. गु. वि. श्री यादवजी)

पुटे पक्वस्य द्रव्यस्य स्वरसो गृह्यते यतः । अतोऽयं पुटपाकः स्याद् विधानं तस्य कथ्यते ।। (परि. प्रदीप)

In certain conditions even though the drugs are collected in wet and fresh form, they cannot produce *swarasaby* usual preparation method of *swarasa* (pounding into paste form and squeezing with cloth). Eg. *Vāsa, Kuṭaja, aralu* etc.

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Hence Ācārya Śāraṅgadhara described *puṭapāka vidhi* as an alternative method for *swarasa,* since the juice taken out by this method is also considered as *swarasa.*

In this procedure the drug will be getting *agni saṁskāra.* A bolus of mud holding within it the *kalka* (paste) of drugs put in to fire and removed, when it becomes red hot. The thickness of the layer of mud should be *two angulas* or *two anguṣṭas.* It is better to wrap the paste of drugs with leaves of *kāśmarī, vaṭa, jambu,* etc. The *puṭapāka swarasa* (juice) should be taken in the *dose of one pala* to which is added one *karṣa* of honey and the proportion of *kalka, cūrṇa* or *other liquids* if to be added shall be the same as described earlier under *swarasa.*

Usual method of puṭapāka swarasa vidhi

Vāsa like plant leaves are taken and made in to paste, the paste is made into bolus form. Which is wrapped by *kāśmarī, vaṭa, jambu* etc., big leaves and tied with"thread and it is covered externally with mud. The thickness of the layer of the mud should be *two angulis* (fingers) or *two anguṣṭas* {thumbs). After drying, this should be kept in between cowdung cakes and kept t in fire. After the mass changes in to red hot, then it is taken out from the fire and the mass is broken for removing the external mud etc., then this *kalka* (in hot state only) is collected and kept over the cloth and squeezed for obtaining *swarasa.* This obtained *swarasa* is called *puṭa pāka swarasa,* because of making the *pāka* of drug in *puṭa* (cow dung cakes) the *swarasa* is produced.

Some of the examples of *puṭapāka swarasa vidhi* are mentioned here under :

Twak - Kuṭaja twak, aralu twak etc.

Patra - Nyagrodha parra, vāsa patra, āmra, jumbu patra etc.

Phala - Pakwa dāḍima phala, vibhītaki phala etc.

Pañcānga's - Kaṇṭakāri etc.

Mūla - Bijapūra, āmra, jambu. sūraṇa kanda, śuṇṭhi cūrṇa. etc.

In *śārangadhara saṁhitā* for each drug in *puṭa pāka swarasa vidhi* some of the specifications are mentioned.

e.g. : For making *kuṭaja puṭa pāka swarasa,* 4 *palas* of fresh bark made in to a thick paste with *taṇḍulodaka* (rice - wash) is wrapped with tender leaves of jambu, tied with thread over this ball. One layer each of *paste* of *godhūma* and mud is made, later slightly dried in sun, put into the fire of cow dung heaps. Here paste of *godhūma* is applied to the bolus externally before applying the mud.

For making *nyagrodha patra swarasa vidhi,* leaves paste of *nyagrodha* is to be filled into the abdomen of a yellow *tittira bird* whose internal organs have been removed. It is then subjected to *puṭa pāka,* and the juice is taken out.

For making *dāḍima puṭa pāka vidhi,* a ripe fruit of *dāḍima* is subjected to *puṭapāka* directly without any covering with mud.

For making *puṭa pāka swarasa* of *śuṇṭhi cūrṇa,* the powder of *śuṇṭhi* mixed with little quantity of ghee, rolled inside the leaves of *eraṇḍa* and subjected *to puṭa pāka* in *mandāgni* (mild fire).

Mātra of puṭa pāka swarasa

Here the *mātra* of *puṭapāka swarasa* is mentioned as *one pala* by *Ācārya Śāraṅgadhara* which is more than the quantity of *swarasa* (Prepared with usual method), because *puṭa pāka swarasa* is considerably having *laghu guṇa* with comparing to the *swarasa* which is obtained from fresh drugs.

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Śyonāka puṭapāka swaras

Apparatus required

Khalvayantra, clean cloth, vessel, thread, cow dung cakes etc.

Drugs required

Śyonāka mūlatwak	-	appropriate quantity
Vaṭa patra or jambūpatra	-	appropriate No.
wheat powder	-	appropriate quantity

Procedure

Śyonāka mūla twak collected and cleaned with water and dried. Then *śyonāka mūla twak* is made into fine paste form with the help of *khalva yantra* and this paste is made into bolus form (round mass), then it is covered externally with appropriate number of *gambhāri, Kāśmarī patras* etc., and tied with thread, then again covered with mud or sticky soil with *two anguli thickness* and it is dried in sunlight. Then this mass is kept in between sufficient number (usually 8) of cowdung cakes and burned. When mass turns into red hot, it is taken out from fire, then all external coverings are breaked and removed, then internal *śyonāka mūlatwak kalka* is collected and while it is hot, kept over cloth, then squeezed for many times and obtained juice is called *śyonāka puṭapāka swarasa.*

Pharmacological Actions

Rasa	:	*Madhura, tikta, kaṣāya*
Guṇa	:	*Laghu, rūkṣa*
Vīrya	:	*Uṣṇa*
Vipāka	:	*Kaṭu*
Karma	:	*Kaphavātaśāmakam, dīpanam, grāhi*
Mātra	:	*1 pala*
Āmayika prayoga	:	*Atisāra, śwāsa, kāsa, śotha, āmavāta, sandhivāta, vraṇa, aruci, agnimāṅdhya, Pravāhika, udara, kṛmi, sannipātaja jwara etc.*

Vāsa Puṭa Pāka Swarasa

पिष्टानां वृषपत्राणां पुटपाकरसो हिमः । मधुयुक्तो जयेद्रक्तपित्तकासज्वरक्षयान् ।। (शा. सं. म. ख. २.३४)

Apparatus required

Khalvayantra, clean cloth, vessel, thread, cowdung cakes.

Drugs required

Wheat powder	-	appropriate quantity.
vaṭa patra or jambu patra	-	appropriate number.
Freshly collected vāsapatra	-	appropriate quantity

Procedure

Freshly collected *vāsapatras* are cleaned with water and dried by washing with dry cloth. Then *vāsa patras* are made in to fine paste form and this paste is made in to bolus form (round mass), then it is covered externally with appropriate number of *vaṭa patras* or *jambu patras* and tied with thread, then

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it is covered with paste made by wheat powder in *one anguli* thickness, then again covered with mud or (sticky soil) with *two anguli* thickness and it is dried in sunlight. Then this mass is kept in between 8 *cow-dung cakes* (*vanyopala*) and burnt, when mass becomes red hot, it is taken out from fire, then all external coverings are breaked and removed, then internal *vāsapatra kalka* is collected while it is hot itself and kept over cloth, then squeezed for many times and obtained juice is called *vāsapatra puṭapāka swarasa.*

Pharmacological Actions

Rasa	:	*Tikta, kaṣāya*
Guṇa	:	*Laghu, rūkṣa*
Vīrya	:	*Śīta*
Vipāka	:	*Kaṭu*
karma	:	*Kaphapittaharam, swaryam, hṛdyam.*
Mātra	:	*1 pala*
Anupāna	:	*Madhu*
Āmayikaprayoga	:	*Vāsapuṭapāka swarasa with madhu relieves raktapitta, kāsa, jwara, kṣaya etc.*

Kalka Kalpanā

Synonyms : Prakṣepa, Āvāpa

य: पिण्डो रसपिष्टानां कल्क: स परिकीर्तित: । (च. सू. ४)

कल्को दृषदि पेषित: । (च.)

उपलदशनादिपिष्टस्तु कल्क: । (अ. सं. क. ४)

द्रव्यमार्द्रं शिलापिष्टं शुष्कं वा सजलं भवेत् । प्रक्षेपावापकल्कास्ते तन्मानं कर्षसंमितम् ।।

(शा. सं. म. ख. ५.१)

A green drug or a dry drug converted into a paste by rubbing it on a stone with a little quantity of water added, is called *kalka*. Its dose is *one Karṣa.*

Procedure

Fresh wet drugs are collected and cleaned with water and made into paste with the help of *khalva yantra.* Some times with dried drugs (*Śuṣka dravya*) also can be converted into *kalka* form, *Śuṣka dravya* is powdered and filtered with cloth and mixed with appropriate quantity of water, kept in *khalva yantra* and made into paste form by rubbing.

It is considered as *Laghuguṇayukta* then the *swarasa.* This is sopposed to be taken immediately after the preparation or with in one *yāma* (three hours).

Kalka Mātra : 1 Karṣa

Prakṣepa Draya Mātra for Kalka

कल्के मधु घृतं तैलं देयं द्विगुणमात्रया । सितागुडं समं दद्याद्द्रवा देयाश्चतुर्गुणा: ।। (शा. सं. म. ख. ५.२)

Honey, ghee and oil is added, if necessary, in double its quantity, sugar or jaggery in equal quantity and any liquid in four times the quantity of *kalka.*

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Uses of Kalka

1. Directly *kalka* can be given in the form of medicine,
2. For the purpose of *sneha Mūrcchana* and *sneha pāka, Kalka* is used,
3. As a *Lepa Kalpana, kalka* is used, e.g. for the treatment of *Vraṇa, Śotha* etc.

Examples

Pippalyādi Kalka	-	*Urustambha*
Nimba Kalka	-	*Vraṇa, Kuṣṭa, Kṛmi, Vamana*
Mahā nimba Kalka	-	*Gṛdhrasī*
Viṣṇu Krānta Kalka	-	*Pariṇāma śūla*
Śuṇṭhi Kalka	-	*Pariṇāma śūla, Āmavāta*
Badarī mūla Kalka	-	*Raktātī Sāra*
Lākṣā kalka	-	*Raktakṣaya, Urahkṣata Kṣaya*
Taṇḍulīyaka Kalka	-	*Rakta Pradara*
Ankolamūla Kalka	-	*Atisāra*

Nimba kalka

लेपान्निम्बदलैः कल्को व्रणशोधन रोपणः । भक्षणाच्छर्दिकुष्ठानि पित्तश्लेष्मकृमीञ्जयेत् ।।

(शा. सं. म. ख. ५.५)

Apparatus required

Khalva yantra etc.

Drug required

Nimba patra-appropriate quantity

Procedure

Collect green and fresh *Neem leaves,* clean them with water and dry them and make them into fine paste form with the help of *khalva yantra.* Then it is called *Nimba kalka.*

It is used both for external application and also for internal administration.

Karma

Vraṇa Ropaṇa, Vraṇa Śodhana.

Āmayika Prayoga

For the treatment of *Vraṇa* it is used as external application and for the treatment of *Chardi, Kuṣṭha, Pitta Vikāra, Kapha vikāra, Kṛmi* etc. diseases, it is used for internal administration.

Rasona Kalka

शुद्धः कल्को रसोनस्य तिलतैलेन मिश्रितः । वातरोगाञ्जेयेत्तीव्रान्विषमज्वरनाशनः ।।

(शा. सं. म. ख. ५.७)

Apparatus required

Khalva Yantra etc.

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Drug required

Lasuna : appropriate quantity

Procedure

Collect the completely developed garlic, remove external layer and make them into pieces and then into paste form with the help of *Khalva yantra* and is called *Rasona Kalka.*

Ānupāna and Āmayika Prayoga

Rasona kalka if it is administered by mixing with appropriate quantity of *taila* then it cures *Vata roga* and Viṣama Jwara etc.

Kwātha kalpanā (decoction)

Synonims :

श्रृत: क्वाथ: कषायश्च निर्यूह: स निगद्यते । (शा. सं. म. ख. २.२)

Śṛta, kaṣāya, niryūha these are the synonims of *Kwātha kalpanā.*

Ragarding kwātha kalpanā different Ācāryas mentioned like viz.

वाह्नौ तु क्वथितं द्रव्यं श्रृतमाहुश्चिकित्सका: । (च. सू. ४.२५)

According to *Ayurvedic Physicians,* medicine prepared by boiling a drug on fire is called *Śṛta.*

पानीयं षोडशगुणं क्षुण्णे द्रव्यपले क्षिपेत् । मृत्पात्रो क्वाथयेद्ग्राह्यमष्टमांशावशेषितम् ।।
तज्जलं पाययेद्धीमान्कोष्णं मृद्वग्निसाधितम् । (शा. सं. म, २.१)

One pala of Coarsely powdered drug is boiled with 16 parts of water in an earthen pot over a mild fire till liquid is reduced to 1/8th' of the orginal quantity.

अपिधानमुखे पात्रो जलं दुर्जरतां व्रजेत् । तस्मादावरणं त्यक्त्वा क्वाथादीनां विनिश्चय: ।। (शा. सं. म. २.७)

The *patra* should not be covered with a lid while preparing the *kwātha* (decoction), by doing so the decoction will not become easily digestible, because that drops which are collected in the lower surface of the lid will be mixed again with *kaṣāya.* So that, it will be diluted.

Jala pramāṇa (According to Consistency of drugs)

तत्रान्यतमपरिमाणसम्मितानां यथायोगं त्वकूपत्राफलमूलादीनामातपपरिशोषितानां छेद्यानि खण्डशश्छेदयित्वा, भेद्यान्यणुशो भेदयित्वा, अवकुटूय, अष्टगुणेन षोडशगुणेन वाऽम्भसाऽभिषिच्य, स्थाल्यां चतुर्भागा वशिष्टंक्वाथयित्वाऽपहरेदित्येप कषायकल्प:, अथवा तत्रोदकद्विद्रोणे त्वकू-पत्रा-फल-मूलादीनां तुलामावाप्य चतुर्भागावशिष्टं निष्क्वाथ्यापहरेदित्येष कषायकल्प: । (सू. चि. ३१.८)

By following the specification of the *māna, twak* (*bark*), *mūla* (*roots*) and *patra* (*leaves*) etc. of medicinal drugs should be dried in sun light (*ātapa pariśoṣitā*) then taken and should be cut into small pieces, or pounded, as the case may be and soaked in a quantity of water weighing eight or sixteen times their combined weight. They should then be boiled over a fire and the decoction should be taken down from the fire with only a guaster part of the water left. This is the method of *kaṣāya kalpanā.*

Kṣārapaṇīs Concept

मृदौ चतुर्गुणं देयं कठिनेऽष्टगुणं जलम् । कठिनात्कठिने देयं बुधै: षोडशिकं जलम् ।।
मृद्वादिक्वाथसंघातैर्मानानुक्ते चिकित्सक: । मध्यस्योभयगामित्वादिच्छन्त्यष्टगुणं जलम् ।।

(Iatro-chemistry of Āyurveda-146-147)

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If the drug used for *kaṣāya* is *mṛdu* (soft), then four times of water should be added and boiled, if it is *kaṭina* (hard) then eight times of water should be added and if it is *kaṭinātkaṭinah* (very hard) then 16 times of water should be added and boiled for preparing the decoction. If the recipe is a mixture of *mṛdu, kaṭina* and *kaṭināthkaṭhinah* drugs and the quantity of water to be added is not specified, then it should be treated as a medium type of recipe which is applicable to both (*Mṛdu* and *Kaṭina* drugs) and eight times of water should be added to this recipe for preparing the decoction.

Śāraṅgadharas concept regarding jala pramāṇa according to consistency of drugs

चतुर्गुणं मृदुद्रव्ये कठिनेऽष्टगुणं जलम् । तथा च मध्यमे द्रव्ये दद्याद्रष्टगुणं पयः ।।
अत्यन्तकठिने द्रव्ये नीरं षोडशिकं मतम् । (शा. सं. म. ख. ७.३-४)

For preparing *kwātha,* one part of drug is boiled in four parts of water and reduced to a quarter. If the drugs are of *mṛdu* (soft nature) water is taken four times of their quantity; if medium or moderately hard (*madyama* or *kaṭhina*), eight times and if *atyanta kaṭhina* (very hard), 16 parts water to be taken and 11 BK reduced to quarter (*chaturdhāvaśeṣa*).

Jala pramāṇa according to quantity of drugs

According to Varāhamihira

माषकादिपलं यावद् दद्यात् षोडशकंजलम् । तदूर्ध्वर्दं कुडवं यावत्तोयमष्टगुणं भवेत् ।।
प्रस्थादेः कुडवादूर्ध्वं, सलिलं य चतुर्गुणम् । प्रस्थादितः क्षिपेन्नीरं खारी यावच्चतुर्गुणम् ।।

(Iatro-chemistry of Ayurveda-144-145)

If the quantity of drug is from *one māṣa* to *one pala,* then sixteen times of water should be added to it and boiled for preparing the *kwātha.* If the quantity is above *one pala* up to *one kuḍava* then eight times of water should be added for preparing the *kwātha.* If the quantity is above one *Kuḍava.* up to one *prastha* then four times of water should be added. If the quantity is above one *prastha* up to one *khārī* then (also) four times of water should be added to it and boiled for preparing the *kwātha.*

According to the other scholars depending upon the drug consistency *mṛdu, madhyama, Kaṭhina,* the water will be added in the ratio of 4:8: 16 times, to the quantity of drug powder and the total quantity contents are reduced to *1/4th* of original quantity and the liquid will be filtered is called *Kaṣāya* or *Kwātha.*

क्वाथे क्षिपेत्सितामंशैश्चतुर्थाष्टमषोडशैः । वातपित्तकफातंके विपरीतं मधु स्मृतम् ।।
जीरकं गुग्गुलं क्षारं लवणं च शिलाजतु । हिङ्गु त्रिकटुकं चूर्णं क्वाथे शाणोन्मितं क्षिपेत् ।।
क्षीरं घृतं गुडं तैलं मूत्रां चान्यद्द्रवं तथा । कल्कं चूर्णादिकं क्वाथे निक्षिपेत्कर्षसम्मितम् ।।

(शा. सं. म. ख. २.४-६)

Prakṣepa dravyas

Sugar may be added to the decoction in doses of 1/4, 1/8 and 1/16th part respectively for *vāta, pitta* and *kapha* disorders. If honey is to be added, it should be in the reverse order of proportion (1/16, 1/8 & 1/4).

Jīraka, guggulu, kṣāra, lavaṇa, silājīt, hiṅgu. trikaṭu are to, be added in proportion of one *śāṇa* each. Milk, ghee, jaggery, oil, cows urine or any other liquid, *kalka, cūrṇa* are to be added in doses of one *karṣa* each.

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The following table shows that the varieties and quantities of *prakṣepa dravya* concerned with *kwātha* according to different ancient scholars.

Author	*Name of the Prakṣepa dravyas*	*Quantity*	*Vyādhi*
Atreya	*Madhu* (honey)	1/16th part of *Kwātha*	*Vātaja*
		1/8th part of *Kwātha*	*Pittaja*
		1/4th part of *Kwātha*	*Kaphaja*
Atreya	*Śarkara* (sugar)	1/16th part of *Kwātha*	*Kaphaja*
		1/8th part of *Kwātha*	*Pittaja*
		1/4th part of *Kwātha*	*Vataja*
Caraka	*Kṣīra, ghṛta, guḍa, taila, gomūtra,* other *drava dravyas, kalka, cūrṇa* and *guggulu*	1 *Karṣa* each	-
Suśruta	*Trikaṭu, śilājitu, kṣāra, lavaṇa, hingu, jīraka, taila, kṣīra, ghṛta and guḍa*	1 tanka each	-
Kāśyapa	*Hingu*	1 *māṣa*	-
	Guḍa, kṣīra, sita	1 *karṣa*	
	Hingu and *saindhava*	1 masa each	
	lavaṇa, (kaṣāya which is used for *naśya)*		
Śāraṅgdhara	Madhu (honey)	1/16th part of *kwātha*	*Vataja*
		1/8th part of *kwātha*	*Pittaja*
		1/4th part of *kwātha*	*Kaphaja*
Śāraṅgdhara	*Śarkara* (sugar)	1/16th part of *kwātha*	*Kaphaja*
		1/8th part of *kwātha*	*Pittaja*
		1/4th part of *kwātha*	*Vāitaja*
Śāraṅgdhara	*Jīraka, guggulu, kṣīra, lavaṇa, śilājitu, hiṇgu, trikaṭu*	One *śāṇa* each	-
Śāraṅgdhara	*Kṣīra, ghṛta, guḍa, taila, gomūtra* or other *drava dravya, kalka, cūrṇa*	1 *karṣa* each	-

Varieties of kwātha according to the Pharmacological actions

Atreyas concept

पाचनो दीपनो यश्च शोधन: शमनस्तथा । तर्पण: क्लेदन: श्पेषण: क्वाथ: सप्तविधो मत: ।।

(तोडरानन्द १५३)

Kwātha is of seven types, Viz.

1. *Pācana* (carminative),
2. *Dīpana* (which stimulates power of digestion)
3. *Śodhana* (which cleanes the body)
4. *Śamana* (which alleviates the aggrevated doṣas)

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5. *Tarpaṇa* (which refreshes)
6. *Kledana* (which helps in producing stickiness)
7. *Śoṣana* (which dries up the tissues)

According to Hārita Saṁhitā the Quality of Kwātha reductions time for Sapta Vidha Kaṣaya

पाचनेऽर्द्धविशेषी स्याच्छेधनो द्वादशांशकः । क्लेदनश्चतुरंशश्च शमनोऽष्टवशोषितः ।।
दीपनीयो दशांशस्तु तर्पणश्च समांशकः । विशेषी षोडशांशश्च क्वाथभेदाः प्रकीर्तिताः ।।

(हा. सं. ३ स्थान, १)

Pācana : It is a *kwātha* in which the *drava* (solution) is reduced to one-half of the total quantity.

Śodhana : It is that type of *kwātha* is which the *drava dravya* is reduced to one-half of the total quantity.

Kledana : It is a *kwātha* in which the *drava dravya* reduced to one-forth.

Samana : It is a *kwātha* in which the solution is reduced to one-eighth.

Dīpana : It is a *kwātha* in which the solution is reduced to one-tenth.

Tarpaṇa : It is a *kwātha* in which the solution is boiled till it reaches the boiling point.

Viśoṣī : It is a *kwātha* in which the solution is reduced to one-sixteenth. It causes thirst.

Pharmacological actions of sapta vidha kaṣāyas

पाचनः पचते दोषन्दीपनेद्दीप्यतेऽनलम् । शोधनो मलशोधी स्याच्छमनः शमते गदान् ।।
तर्पणास्तर्प्यते धातून्क्लेदी हत्क्लेदकारकः । विशोषी शोषमादत्ते तस्मात्क्वाथान्परीक्षयेत् ।।

(तोडरानन्द १५४-१५५)

1. *Pācana* type of decoction helps in the metabolic transformation of tissue elements.
2. *Dīpana* type of decoction stimulates the power of digestion.
3. *Śodhana* type of decoction eliminates waste products from the body.
4. *Śamana* type of decoction alleviates diseases.
5. *Tarpaṇa* type of decoction provides nourishment to tissues.
6. *Kledana* type of decoction produces hrtkledana
7. *Śoṣaṇa* type of decoction causes dryness of the body.

General Preparation of Kwātha Cūrṇa

Certain drugs or combination of drugs are made into coarse powder and kept for preparation of *kaṣāya*. Such powders are called *kwātha cūrṇas* or *kaṣāya cūrṇas*. *Kwātha cūrṇa* are intended for usage whenever as particular type of *kwātha* (decoction) is required. These *kwātha cūrṇa* are not to be used as *cūrṇa*, which is ment for internal administration.

Drugs and equipment required

1. The. drugs cleaned and dried, 2. Mortar and pestle, 3. Trays for drying.

Process of Preparation

The drugs that are to go into the composition of the particular *kwātha cūrṇa* are taken and cleaned. They are perfectly dried and powdered separately and then mixed. The powders should be coarse.

Pounding the drugs in a mortar until coarsely powdered is sufficient, because the *kwātha cūrṇa*

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should not be a fine powder. If the powder be very fine, the decoction is not easily filtered into a clear liquid, this is due to the fine particles, passing through the filter. In large scale preparation of *Kwātha cūrṇa,* electrically driven disintegraters are used. When the decoction is prepared with the *kwātha cūrṇa,* the vessel should be kept open to allow the water vapours to escape and finally *kwātha* is obtained in the vessel.

The decoction thus prepared should be made used within twenty four hours after it has cooled. If stored for a longer time fungal contamination will occur.

Some of the observations to be followed during preparation of Kwātha

1. *Kaṣāya* will be prepared by utilizing coarse powder which is made by dry freshly collected single or multiple drugs.
2. After making the *kaṣāya* drug into coarse powder form it may loss its potency crossing rainy season. Hence according to requirement little by little quantity only *kaṣāya* raw drugs are to be powdered and preserved in glass container to make *kaṣāya* whenever required.
3. A decoction should not be allowed to evaporate after the proper strength is reached, nor should it be boiled again after being once taken off the fire and placed on the ground.
4. *A decoction should be rejected when*
   1. It assumes a dark, blue or red colour
   2. It becomes thick, slimy or weak
   3. It is over boiled
   4. It emits a bad smell.
   5. The odour of the decoction should be of the nature of the drugs used and its appearance pure on lustrous.

Preservation

The *Kwātha cūrṇa* keep good for about an year, if protected from moisture and insects. The *Kwātha cūrṇa* should be packed in air tight container. Generally they will be packed in plastic polythene bags. These packets are again enclosed in card board boxes.

Uses

The required concentration of decoction should be prepared from these and used within a day.

Generally *kwāthas* are prescribed as *anupānas* of other drugs. The pricipal drug should, therefore, be taken or mixed with such decoction.

According to *Ācārya Caraka* it is used in 7 types, they are *sneha kalpanā, śeka, pāna, vraṇaśodhana, āschothana, gaṇḍūṣa, nirūhavasti.* According to other *Ācāryas* this *kwātha* also used for *Ariṣṭanirmāṇa, Avalehya nirmāṇa* etc.

At present some of the *Āyurvedic pharmacies* are preparing *kwāthas* in concentrated liquid form, where in all the properties of the crude *Kwāthas* have been preserved up to some extent.

Where as other pharmacies are preparing *Kwātha* concentration, which is ment for preparation of instant decoctions.

Mātra and mode of administration

Ancient physicians advise its administration should be after the digestion of food in the dose 2 *palas* per time. Which is in slightly warmed media.

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Some of the commonly using kwātha cūrṇas with their references are mentioned below :

Formulation	*Reference*
Amṛtottara Kwātha cūrṇa	*Sahasrayoga, Kaṣāyaprakaraṇa.*
Ardhabilva Kwātha cūrṇa	*Sahasrayoga, Kaṣāyaprakaraṇa*
Aṣṭavarga Kwātha cūrna	*Sahasrayoga, Kaṣāyaprakaraṇa*
Āragvadhādi Kwātha cūrṇa	*Aṣṭāṅgahṛdaya. Sūtrasthāna, Adhyāya 15*
Gandharvahastādi Kwātha Cūrṇa	*Sahasrayoga, Kaṣāyaprakaraṇa.*
Caturbhadra Kwātha Cūrṇa	*Bhaiṣajyaratnāvalī, Grahaṇīrogādhikāra*
Chinnodbhavādi Kwātha Cūrṇa	*Sahasrayoga, Kaṣāyaprakaraṇa.*
Trāyantyādi Kwātha Cūrṇa	*Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya 13.*
Daśamūla Kaṭutraya	*Sahasrayoga,*
Kwātha Cūrṇa	*Kaṣāyaprakaraṇa*
Daśamūla Kwātha Cūrṇa	*Bhaiṣajyaratnāvalī, Kāsarogādhikāra.*
Daśamūla Pañcakolādi	*Sahasrayoga*
Kwātha Cūrṇa	*Kaṣāyaprakaraṇa*
Dārunāgarādi Kwātha	*Sahasrayoga*
Cūrṇa	*Kaṣāyaprakaraṇa*
Drākṣādi Kwātha Cūrṇa	*Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya 1.*
Nāyopāyam Kwātha	*Sahasrayoga,*
Cūrṇa	*Kaṣāyaprakaraṇa.*
Nimbādi Kwātha Cūrṇa	*Cakradatta, Jvaracikitsā.*
Nyagrodhādi Kwātha Cūrṇa	*Aṣṭāṅgahṛdaya, Sūtrasthāna, Adhyāya 15.*

Modern Concept of Kwātha (Decoction)

Decoction is the process in which the water soluble and heat stable constituent of hard and woody crude drugs are extracted out. Here water is used as menstrum for the stated time. Adjustment to final volume is necessary to get a uniform product because different workers will use different types of vessels and different sources of heat resulting into loss of water in different quantities by evaparation form. A freshly prepared decoction should only be dispensed and the same must be consumed within 24 hours. At present no decoction is official in I.P. or B.P.

Punarnavāṣṭka Kwātha

पुनर्नवानिम्बपटोलशुण्ठीतिक्ताऽमृतादार्वभयाकषाय: ।
सर्वाङ्गशोथोदरकासशूलश्वासान्वितं पाण्डुगदं निहन्ति ।।

(चक्रदत्त, उदररोग ३३)

पुनर्नवाभयानिम्बदार्वीतिक्तापटोलकै: । गुडूचीनागरयुतै: क्वाथो गोमूत्रासंयुक्त: ।।
पाण्डुकासोदरश्वासशूलसर्वाङ्गशोथहा । (शा. सं. म. २.७७)

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Apparatus required

Kwātha pātra, cloth, measurement scale, khalvayantra etc.

Drugs

1. Purnarnava
2. Abhaya phala twak
3. Nimba twak
4. Dāruharidra
5. Kaṭuka
6. Paṭola patra
7. Guḍūci kāṇḍa
8. Śuṇṭhi

All together 1 part and all drugs should be taken in equal quantity

9. Water — 16 parts

Procedure

Above mentioned 8 drugs are made into *yavakūṭa cūrṇa* separately and mixed together, then taken in to *kwātha pātra* and 16 times of water is added, then it is kept for one night, next day morning contents are heated over *mṛdvagni,* till total contents are reduced to I/8th quantity and filtered with clean cloth and obtained *kwatha* is called *punarnavāṣṭaka kwātha.*

Mātra : 2 to 4 tolas

Āmayika prayoga

Punarnavaṣṭaka kwātha taken with *gomūtra* relieves *relieves pāṇḍu, kāsa, udara, śwāsa, śūla* and *sarvānga śotha.*

According to need *punarnavāṣṭaka kwātha* also can be taken by mixing with *guḍa, śarkara, silājit, lavaṇa, kṣāra, hingu, gomūtra* etc. in appropriate quantity.

Rāsna Saptaka Kwātha

रास्ना गोक्षुरकैरण्डदेवदारू पुनर्नवा । गुडूच्यारग्वधश्चैव क्वाथमेषां विपाचयेत् ।।
शुण्ठीचूर्णेन संयुक्तं पिबेज्जङ्घाकटिग्रहे । पार्श्वपृष्ठोरूपीडायामामवाते सुदुस्तरे ।।

(शा. सं. म. ख. २.८६-८७)

Apparatus required

Kwātha pātra, cloth, measurement scale, *khalvayantra* etc.

Drugs

1. *Rāsna*
2. *Gokṣūra*
3. *Eraṇḍa*
4. *Devadāru*
5. *Punarnava*
6. *Guḍūci*
7. *Āragwadha*

All together 1 part and all drugs should be taken in equal quantity

8. Water — 16 parts

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Procedure

Rāsna except water (7 drugs) are made into *yavakūṭa cūrṇa* separately and mixed together, then collected into *kwātha pātra* and added to 16 times of water and it is kept over night, next day morning, contents are heated over *mṛdu agni* till total contents get reduced to 1/8th part, then contents are filtered with clean cloth, obtained *kwātha* is called *Rāsna Saptaka Kwātha.*

Anupāna and Āmayika Prayoga

Śuṇṭhi cūrṇa or *eraṇḍa taila* is dissolved in this *kwātha* and taken internally, then it relieves *jangāgraha, kaṭigraha, pārśwapīḍa, pṛṣṭhapīḍa, urupīḍa, āmavāta.*

Mātra : 2 to 4 tola

Pāniya Kalpanā

क्षुण्णं द्रव्यपलं साध्यं चतुःषष्टिपले जले । अर्धशिष्टं च तद्देयं पाने भक्तादिसंविधौ ।।

(सां. सं. म. ख. २-१५७)

One pala of drug boiled in *sixty four palas* of water and reduced to half the quantity is called *panīya* and used as a drink.

Ṣaḍanga Pānīya

Apparatus required

Kaṣāya pātra, stirrer and measurement scale, cloth etc.

Drugs Required

Usīra	
Parpaṭa	
Udīcya	
Musta	*: 1 Part*
Nāgara	
Candana	
Water	*: 64 Parts*

Procedure

Yavakūṭa cūrṇa of above mentioned *six drugs* is made and added to 64 times of water to that of drugs. Then the liquid contents are to be boiled with *mandāgni* till the total quantity of contents are reduced to half of the quantity. Then the contents are filtered with cloth and collected liquid is called *Ṣaḍanga Pānīya.* This *pānīya* should be cooled before- administration. This recipe popularly known as *Ṣaḍanga pānīya* because it consists of six drugs. All the drugs of this recipe except *nāgara* are having *tiktarasa. Nāgara* has been specifically added to this recipe to correct the affliction of *āmaśaya.* This drug also helps in allevation of *jwara.*

Ācārya Vāghbhaṭa in the place of *śuṇṭhi,* another drug has mentioned called as *padmākṣa.*

Karma

Dīpana, āmadoṣaharam, pācanam

Āmayika Prayoga

Jwara, pipāsa, dāha

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Mātra : Dose has to be altered according to the requirement.

Phāṇṭa Kalpanā

One pala of "a powdered drug and *one kudava* of hot water are kept in a mud pot and filtered through cloth after some time. This liquid known as *Cūrṇadrava* or *Phāṇṭa* (infusion), is administered "in dose of *two palas. Honey, sugar* or *jaggery* to be added shall be in the same proportion as that of *kwātha.*

Phāṇṭa preparation mentioned in some of the classics as follows.

For the preparation of the *phāṇṭa* firstly water has to be boiled, during that time the respected quantity of drug in coarse powder form has to be immersed, then earthen pot has to be taken out from the fire then water becomes some what cold, then it should be rubbed with hands and filtered with cloth, then it is allowed for administration.

Sudarśana Phāṇṭa

Apparatus required

Khalva Yantra, Vessel, cloth etc.

Drugs

Āmalakī	*Harītaki*	*Vibhītaki*	*Haridra*
Dāru haridra	*Kaṇṭa Kāri*	*Brhati*	*Śaṭī*
Śuṇṭhi	*Pippali*	*Marica*	*Pippalīmūla*
Mūrva	*Guḍūci*	*Yavāsa*	*Kaṭuka*
Parpāṭā	*Nāgaramotha*	*Trāyamāṇa*	*Netrabāla*
Nimbatwak	*Puṣkaramūla*	*Yaṣṭīmadhu*	*Vatsaka*
Ajavain	*Indrayava*	*Bhārangī*	*Śigrubīja*
Saurāṣṭrakam	*Vacā*	*Dālcīnī*	*Padmakāṣṭha*
Uśīra	*Śweta candana*	*Ativiṣā*	*Balāmūla*
Śāliparṇi	*Pṛśniparṇi*	*Viḍanga*	*Tagara*
Citrakamūla	*Devadāru*	*Cavya*	*Paṭola Patra*
Jīvaka	*Ṛṣabhaka*	*Lavanga*	*Vaṁśalocana*
Kamala puṣpa	*Kākolī*	*Teja Patra*	*Jātīpatra*
Tālīs a patra			

Procedure

All drugs in equal parts are powdered and to it is added half the total quantity of powder of *Kirātatiktā cūrṇa* and uniformly mixed well. This recipe is known as *Sudarśana cūrṇa* and by using this *Sudarśana cūrṇa, phāṇṭa* can also be prepared and called *sudarśana phāṇṭa. (Ācārya Sri Yādavji* in his *Siddhayoga Saṅgraha jwara Prakarana,* mentioned that, by using this *Sudarśana Cūrṇa, hima* or *phāṇṭa* can be prepared.) *One tola* of *sudarśana cūrṇa* can be immersed in 16 *tola* of boiling water then the vessel is taken out from fire and when water becomes cold, powder is rubbed with hands and then filtered with cloth. Such obtained liquid is called *Sudarśana phāṇṭa (Siddhayoga sangraha).*

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Āmayika Prayoga

All types of *jwara, santāpa.*

Mātra : 4 tola.

Pañcakola Phāṇṭa

त्रिफला रजनीयुग्मं कण्टकारीयुगं शठी । त्रिकटु ग्रन्थिकं मूर्वा गुडूची धन्वयासकः ।।

(भा. प्र. हरीतक्यादि ७४)

Apparatus required

Khalva yantra, vessel, cloth etc.

Drugs

Pippalī	:	(1 kola)	1 Part
Pippalī mūla	:	(1 kola)	
Cavya	:	(1 kola)	
Citraka mūla	:	(1 kola)	
Nagara	:	(1 kola)	
Water	:	4 parts	

Procedure

Above mentioned five drugs has to be made into coarse powder form separately and taken in equal quantity (each drug 1 kola or $^1/_2$ tola *Pramāṇa*) and this powder is immersed in 4 parts (10 tola) of boiling water. Then, vessel has to be taken out from the fire and when water becomes cold, powder is rubbed with hands and then filtered with cloth. Obtained liquid is called *Pañcakola Phāṇṭa.*

Karma

Dīpana, Pācāna.

Āmayika Prayoga

Kaphavikāra, vātavikāra, kapha jwara, vātajwara, pratiśyāya etc.

Anupāna : Śarkara, ghṛta

Some of the phāṇṭa kalpanā with their āmayika prayoga mentioned here under.

	Name of Phāṇṭa Kalpanā		*Āmayika Prayoga*
1.	Bṛhanmadhūka Phāṇṭa	:	Vāta pitta jwara, dāha, tṛṣṇā, mūrcchā, arati, bhrama, rakta, pitta, mada.
2.	Āmrādi phāṇṭa	:	Severe jwara, pipāsā, chardi, atisāra, Mūrcchā.
3.	Laghumadhūka puṣpādi phāṇṭa	:	Tṛṣṇā, pittahara, dāha, phāṇṭa mūrcchā, bhrama.
4.	Kuṭaja phāṇṭa	:	Vamana, Atisāra.

Himạ Kalpanā
(Cold Infusion)

Synonims

Hima, Śita Kaṣāya.

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Introduction

The drugs having *śīta vīrya* and *volatile principles* may loose their active principles by heating, hence for such type of drugs the *hima kalpanā* is mentioned, by which active ingredients can be collected in cold infusion form.

शीतो रात्रिं द्रवे स्थित: । (अ. ह. क. ६-१०)

In *Dravya Guṇa* Vijñāna, it is. mentioned that one part of the drug has to be immersed in 3 parts of water.

द्रव्यमर्धपलं क्षुण्णं त्रिभिर्नीरपलै: प्लुतम् । निशोषितं हिम: स स्यात्तस्य मात्रा पलोन्मिता ।।
सितामधुगुडादींस्तु क्वाथवत् प्रक्षिपेद्भिषक् । (द्रव्यगुणविज्ञान : श्री यादवजी)

Prakṣepa Dravyas

Sitā, madhu, guḍa etc. are mixed with *hima kalpanā* according to the need and allowed for administration. Here the ratio of *prakṣepa dravya's* in *hima kalpanā* is followed like *kwātha kalpanā.*

Mātra : According to *Ācārya śāraṅgadhara, hima kalpanā mātra* is same as the *mātra* of *phāṇṭa* and it is *two palas.*

Ācārya Yādavji mentioned *hima kalpanā mātra* as 1 *pala.*

According to Ācārya Caraka

द्रव्यादापोत्थितात्तोये प्रतप्ते निशि संस्थितात् । कषायो योऽभिनिर्याति स शीत: समुदाहृत: ।।
(च. सू. ४ चक्रपाणी टीका मै शौनक वचन)

According to *Ācārya Caraka, hima kalpanā* is prepared by putting the coarsely ground drug in boiled water and kept over night then filtered and the obtained liquid is called *śīta kalpanā.* Here instead of cold water boiled water is mentioned by *Ācārya Caraka.*

क्षुण्णं द्रव्यपलं सम्यक्षड्भिर्नीरपलै: प्लुतम् । निशोषितं हिम: स स्यात्तथा शीतकषायक: ।।
तन्मानं फाण्टवज्ज्ञेयं सर्वत्रौवैष निश्चय: । (शा. सं. म. ख. ४.१-२)

One pala of powdered drug is put into *eight palas* of cold water and kept one night in a pot. It is filtered through cloth next morning and used in the same dosage as that of *phāṇṭa.* This is known as *hima* or *śīta kaṣāya* (cold extract).

(While filtering the liquid the *cūrṇa* has to be rubbed with hands to get proper activated form of *hima kalpanā*).

E.g. of hima kalpanā with their āmayika prayoga.

1. *Guḍūcī hima* : *Jīrṇa jwara*
2. *Dhānyaka hima* : *Anthārdāha, tṛṣṇā, srotoviśodhaka.*
3. *Dhānyakādi hima* : *Rakta pitta, jwara, dāha, tṛṣṇā, śoṣa*
4. *Āmrādi hima* : *Rakta pitta*
5. *Marīcādi hima* : *Tṛṣṇa, vamana*
6. *Nīlotpaladi hima* : *Vātapittajwara, pralāpa, bhrama, vamana, moha tṛṣṇa*
7. *Vāsa hima* : *Raktapitta, kāsa, jwara.*

Introduction

Hima (śīta kaṣāya) kalpanā usually prepared by *śītavīrya* and *sugandhita dravyas* and it is admin-

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istered for the purpose of *pittapraśamana. Hima kalpanā* is used directly as a medicine and also used for the preparation of other *kalpanās* like *śarkara, pānaka* etc.

Śārivādi hima kalpanā

Ref : Siddhayogasaṅgraha Sri Yādavji

Apparatus Required

Earthen pot, khalva yantra, cloth etc.

Drugs Required

1. *Ananta mūla*
2. *Bṛhat śāriba*
3. *Copcīni*
4. *Maṅjiṣṭa*
5. *Guḍūci*
6. *Yavāsa*
7. *Rakta candana*
8. *Gulavanapsa*
9. *Usīra*
10. *Muṇḍī*
11. *Cirāyata*
12. *Kamala puṣpa*
13. *Gulab puṣpa*
14. *Droṇa puṣpa*
15. *Padmakāṣṭha*
16. *Śaṅkha puṣpi*
17. *Water*

All together 1 part and all drugs should be taken in equal quantity.

- 6 parts

Procedure

All the above mentioned drugs should be made in to *yavakūṭa cūrṇa* and mixed 6 times of hot water in an earthen pot and it is kept for one night, by exposing with moon rays, then next day morning contents are rubbed with hands and filtered with clean cloth, such obtained product is called *Sārivādi Hima Kalpanā.*

Mātra : 8 tulas.

Anupāna : Sugar

Āmayikaprayoga

Raktajavyādhi, pittaja vyādhi, pāṇḍu, kaṇḍu, hastapāda dāha, āmlapitta, purāṇajwara etc.

Dhānyaka hima

प्रातः सशर्करः पेयो हिमो धान्यकसंभवः । अन्तर्दाहं तथा तृष्णां जयेत्स्रोतोविसोधनः ।। (शा. सं. म. ख. २. ७-८)

Apparatus required

Earthen pot, cloth, khalvayantra etc.

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Drugs required

Dhānyaka (dhaniya) - 1 part
water - 6 parts

Procedure

Dried *dhānyaka* is made in to *yavakūṭa cūrṇa* with the help of *khalva yantra* and it is collected in to an earthen pot and hot water is added, then kept it for one night by exposing it moonrays. Next day morning contents are rubbed with hands and filtered with clean cloth, obtained product is called *dhānyaka hima kalpanā.*

Mātra : 8 tola

Anupāna and time of administration

Dhānyaka hima is advised to take in *prātah kāla* and while administration appropriate quantity of sugar has to be mixed with *dhānyaka hima.*

Karma

Srotoviśodhanam.

Āmayika Prayoga

Antardāha, tṛṣṇa.

Uṣṇodaka

अष्टमेनांशशेषेण चतुर्थेनाधंकेन वा । अथवा कथनेनैव सिद्धमुष्णोदकं वदेत् ।।
श्लेष्मामवातमेदाघ्नं बस्तिशोधनदीपनम् । कासश्वासज्वरहरं पीतमुष्णोदकं निशि ।।

(शा. सं. म. ख. २.१५९-१६०)

Requirements

Vessel, pure water

Procedure

Reduction of water after boiling to 1/8th, 1/4th or *1/2* of its original quantity, is called *uṣṇodaka.* It is advised to take at night.

Karma

Sleṣma haram, vastiśodhanam, dīpanam.

Āmayika Prayoga

Āmavāta, medovikāra, kāsa, śwāsa, jwara.

Taṇḍulodaka (Taṇḍula jala)

कण्डितं तण्डुलपलं जलेऽष्टगुणिते क्षिपेत् । भावयित्वा जलं ग्राह्यं देयं सर्वत्रा कर्मसु ।।

(शा. सं. म. ख. २.२८)

Introduction

Broken rice is immersed in cold water and taṇḍulodaka is prepared with that. The method of preparation is similar to *śītakaṣāya.* But it is mentioned under the context of *swarasa kalpanā* in *Śāraṅghadhara saṁhitā.*

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Apparatus required

Earthen pot, cloth, vessel etc.

Drugs required

Broken rice (Taṇḍula) - 1 part (1 pala)

water - 8 parts

Procedure

Broken rice (Rice is broken into pieces or made into coarse powder form), is taken in an earthen pot and added 8 times of water. Then it is kept for 3-6 hours. After that, contents are rubbed with hands for some time, then contents are filtered into another vessel, with the help of cloth and obtained product is called taṇḍulodaka.

Here, keeping the contents for 3-6 hours, specific time period is not mentioned in *Śārṅgadhara Saṁhitā,* but usually in practice it is done in this manner.

Some of the *Āyurvedic scholars* mentioned that, *taṇḍula,* after pounding, cleaned with fresh water, then immersed in specific quantity of water. Here regarding quantity of water some have mentioned 4 times and 6 times also. *Taṇḍulodaka* prepared with 4 times of water may posses more *guruguṇa.*

Karma

Grāhī

Mātra : *4 tola*

Āmayika Proyoga

Swetarakta pradara etc.

It is usually given as *anupāna* with some *grāhī auṣadha*

Lākṣā rasa kalpanā

Lākṣā *(Carteria lacca, insect product)*

Sanskrit name : Lākṣa

English : Lac

Hindi : Mah

Lākṣa is a resinous substance usually of redish or dark brown colour, with a disagreable smell and easily breakable with a cracking sound, deposited on the twigs of trees such as *Banyan, croton, acacia* and *pīpul* by a small insect called the *Carteria lacca.* Regarding formation of *lākṣā* different opinions are present.

Some state that the insects attach the young branches of the trees above mentioned and fix themselves to the branches; the female insect after ovaposition is effected dies giving out from her body a reddish liquid which solidfies and forms a crust about an inch thick round the branch attached.

According to another concept the sting of the insect affects the sap or gum of the trees, which forms the *lākṣā.*

According to other concept the deposit is the excreta of the insects.

Pharmacological Actions

For the treatment of *Hikka, Kāsa, Rakta Pitta, Dhātugatajwaram, Dantagata roga, lākṣā* is also

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used for inclusion in the form of several medicinal oil as *Lākṣādi taila, Candanādi taila, Angārika taila* etc.

Lākṣā Rasa Preparation

Aquiring the active ingredients in water media by heating is called *lākṣā rasa kalpanā.*

षड्गुणेनाम्भसा लाक्षां दोलायन्त्रो विपाचयेत् । त्रिसप्तधा परिस्त्राव्या लाक्षारसमिमं विदुः ।।

(द्र. गु. वि. यादवजी)

Apparatus required

Dolayantra etc.

Drugs required

Lākṣā - 1 part, Water -6 parts

Procedure No.1

One part of *Lākṣā* is taken and separated from forien bodies etc. and collected in a cloth then made in to *poṭṭalī* and it is kept hanged in the vessel, which contains 6 times of water inside (*dolāyantra*). Then contents are heated over *mandāgni,* till liquid portion is reduced upto l/4th quantity. Then contets are cooled and filtered for 21 times, with the help of cloth and obtained product is called *lākṣārasa.* Next day morning the *Lākṣā* powder is crushed with hands in water, then this liquid is filtered for 21 times with a cloth. The obtained red colour liquid is called *Lākṣā rasa.*

Procedure No.2

Drugs required

1. *Lākṣā* - 10 gms
2. *Lodhra twak cūrṇa* - 1 gm.
3. *Swarjikākṣāra* - 100 gm
4. *Badarapatra kalka* - little quantity
5. Water - 160 ml.

Method : Lākṣā, lodhra twak cūrṇa, badara patrakalka and *swarjikākṣāra* are taken in mentioned quantity in a colth and made in to pottali form, then hanged in a vessel (*dolāyantra*) and it is heated over *mandāgni,* till the water is reduced to 1/4th quantity and vessel is taken out, then contents are filtered with cloth for 21 times and obtained product is called *lākṣā rasa kalpanā.*

While heating, in between *poṭṭalī* has to be compressed with forceps by which proper quantity of *lākṣārasa* dissolves in water. Here it can be noticed that, water quantity mentioned as 16 times.

Mātra : 25m.l. to 50 m.l.

Indications

Vraṇa, asthi bhagna, jwara, urahkṣata.

Māṁsarasa

द्रव्यतो द्विगुणं मांसं सर्वतो द्विगुणं पयः । पादस्थं संस्कृतं चाज्ये षडङ्गो यूष उच्यते ।। (वै. प. प्र. द्वि. स. ६७)

One part of *dravya,* two parts of *māṁsa* and four parts water, all together mixed in a vessel and cooked till the total contents are reduced up to 1/4th quantity. The contents are filtered with a cloth, then

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the obtained liquid is made *bharjana* with appropriate quantity of *Goghṛta,* then it is called *māṁsarasa.* This is also called as *ṣaḍaṅga yuṣa.*

पाकपात्रो घृतं दद्यात्तैलञ्च तदभावतः । तत्रा हिङ्गु हरिद्रां च भर्जयेत्तदनन्तरम् ।।
छागादेरस्थिरहितं मांसं तत्खण्डितं ध्रुवम् । धौतं निर्गालितं तस्मिन्घृते तद्भर्जयेच्छनैः ।।

(भा. प्र. कृतान्नवर्गः ८०-८१)

Ācārya Bhāva Miśra regarding *māṁsa rasa* preparation mentioned like this, *ghṛta* is taken in *pāka pātra* (The vessel which is used for the preparation of *māṁsa rasa*) and melted. In the abscencve of *ghṛta, taila* also can be taken. After ghee is get heated *hiṅgu* and *haridra* are added and fried (*Bharjana*) well, then *ajamāṁsa* (Goat meat) is mixed in the form of bone less pieces (Before adding the meat pieces they should be cleaned well) and meat pieces are made *bharjana.* Then appropriate quantity of water is added, then appropriate quantity of *lavana* is to be added and mixed well. Then vessel is closed with lid and cooked well. *Māṁsa* is filterd, then after, in obtained liquid *vesavāra dravyas* (spice of meat) in the form of *prakṣepa dravyas* are added and mixed well, then heated for some time after that, contents are filterd with cloth and obtained product is called *māṁsa rasa.* When *māṁsa* is properly cooked, *vesavāra* (spice of meat) which is grinded in water is taken and mixed with contents. The obtained product is called *māṁsa rasa.*

Vesavāra

Vesa vāra kalpanā is similar to the *māṁsa rasa.*

द्रव्याणि वेसवारस्य नागवल्लीदलानि च । तण्डुलाश्च लवङ्गानि मरिचानि समासतः ।।

(भा. प्र. कृतान्नवर्गे)

According to *Bhāva Miśra vesavāra* term is mentioned for some group of drugs, i.e. *Nāgavallī patra, taṇḍula, lavanga, marica.* These all drugs are suppose to be taken in equal quantity.

चित्राकं पिप्पलीमूलं पिप्पलीचव्यनागरम् । धान्याकं रजनीश्वेततण्डुलाश्च समांशकाः ।।
वेशवार इति ख्यातः शाकादिषु नियोजयेत् ।। (आत्रेयसंहिता)

According to *Ātreya saṁhitā, citraka, pippalī mūla, pippalī, cavya, nāgara, dhānyaka, haridra, taṇḍula,* are suppose to be taken in equal quantity by the name of *vesa vāra.*

Here *vesa vara dravyas* can be considered as *prakṣepa dravyas* of *māṁsa rasa.* Regarding the ratio of *māṁsa* and, water while preparing the *māṁsa rasa, Sri Yādavji* in his *dravyaguṇa vijñāna* mentioned like wise.

पलाषकं जले प्रस्थे घनेऽथ मध्यमे तु षट् । मांसस्य वण्टनं कुर्यात् कुडवे तनुके रसे ।।

(द्र. गु. वि. यादवजी)

1. If *māṁsa rasa ghana* is suppose to be prepared then *māṁsa* 8 *pala* and *jala* 1 *prastha* in quantity are taken and *māṁsa rasa* is prepared.
2. If *madhyama māṁsa rasa* is suppose to be prepared 6 *pala's* of *māṁsa* and 1 *prastha* of water are taken.
3. If *tanu māṁsa rasa* is suppose to be prepared then 1 *kudava* of *māṁsa* and 1 *prastha* of water are taken.

Varities of Māṁsa Rasa

अस्नेहलवणं सर्वमकृतं कटुकैर्विना । विज्ञेयं लवणस्नेहकटुकैः संयुतं कृतम् ।। (सु. सू. ४६/३९७)

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1. *Kṛta māṁsa rasa.*, 2. *Akṛta māṁsa rasa.*

Pharmacological Actions of Māṁsa Rasa

मांसं निरस्थि सुस्विन्नं पुनर्दृषदि पेषितम् । पिप्पलीशुण्ठिमरिचगुड़सर्पिः समन्वितम् ।।
ऐकध्यं पाचयेत् सम्यग वेसवार इति स्मृतः ।। (सु. सू. ४६/३६५)

Mantha Kalpanā

Different scholors of *Āyurveda* explained about *mantha kalpanā* like wise :

Śāraṅgadharas Concept

मन्थोऽपि फाण्टभेदः स्यात्तेन चत्रौव कथ्यते । जले चतुःपले शीते क्षुण्णं द्रव्यपलं क्षिपेत् ।।
मृत्पात्रो मन्थयेत् सम्यक् तस्माच्च द्विपलं पिबेत् । (श. सं. म. ख. ४.९-१०)

Ācārya śāraṅgadhara considered *mantha kalpanā* as a *phāṇṭa bheda* (variety of *phāṇṭa)* and explained about *mantha kalpanā* under the heading of *phāṇṭa kalpanā.* One *pala* of powdered drug is put in four *palas* of cold water and churned well in a earthen pot for some time to thick consistence. Then after filtered with cloth and obtained liquid product known as *mantha* and it sould be administered in the dose of two *palas.*

Eg-

Kharjūrādimantha	-	*Madātyaya*
Masūrādimantha	-	*Chardi*
Yavasaktumantha	-	*Tṛṣṇa, dāha, rakta pitta*
Sarkarādimantha	-	*Apatarpana janya roga, kṛsata*
Tyuṣanādi mantha	-	*Santarpana janya roga*

(Because cold water is used for the preparation of *mantha kalpanā,* this is more appropriated that, to consider under the *hima kalpanā*)

Susruta concept

सक्तवः सर्पिषाऽभ्यक्ताः शीतवारिपरिप्लुताः । नातिद्रवा नातिसान्द्रा मन्थ इत्युपदिश्यते ।।
(सु. सू. ४६/३८५)

General Preparation of Mantha Kalpanā

Apparatus Required

Earthen pot, churner (mathānī), cloth etc.

Drugs Required

Medicinal drug powder : 1 part (1 pala 48 gms)
Water : 4 parts (4 pala 192 gms)

Procedure

1 *Pala* of medicine of drug in fine powder from is put in 4 *palas* of cold water in an earthen pot and contents are churned well, while doing so active principles get disolved in water. Then after contents are filtered with cloth and obtained liquid is called *mantha kalpanā.*

Mātra : 2 pala (96 gms)

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Anupāna : Sita, madhu, guda,

Ācārya Agnivesa concept

मन्थः खर्जूरमृद्वीकावृक्षाम्लाम्लीकदाडिमैः । परूषकैः सामलकैर्युक्तो मद्यविकारनुत् ।।
अपि च-स्वादुरम्लो जलकृतः सस्नेहो रूक्ष एव वा । सद्यः सन्तर्पणो मन्थः स्थैर्यवर्णबलप्रदः ।।

(च. सू. २३/३९)

Kharjūrādhi Mantha

खर्जूरदाडिमीद्राक्षतिन्तिडीकाम्लिकामलैः । सपरूषैः कृतो मन्थः सर्वमद्यविकारनुत् ।।

(शा. सं. म. ख. ४.१०-११)

Apparatus Required

Earthen Pot, churner (rnathāni), cloth, khalwa yantra etc.

Drugs Required

Seedless kharjūra	:	*1 part*
Pakva dāḍima phala bīja	:	*1 part*
Drākṣa	:	*1 part*
Tintiḍika	:	*1 part*
Āmlika	:	*1 part*
Āmalaki	:	*1 part*
Parūṣaka	:	*1 part*
Water	:	*4 parts*

Procedure

Make paste form of above mentioned all 7 drugs with the help of *khalva yantra* and this contents are immersed in 4 times of water in an earthen pot for 1 to 2 hrs. then the contents are churned and, rubbed with hands. Then after contents are filterd with a cloth and obtained liquid is called *kharjūrādi mantha.*

Mātra : 2 Palas (96 gms)

Āmayika Prayoga

1. Madhāthyaya

It can be administerd every 4th hr to get good result.

Auṣadha Siddha Pānīya

क्षुण्णं द्रव्यपलं साध्यं चतुःषष्टिपले जले । अर्धशिष्टं च तद्देयं पाने भक्तादिसंविधौ ।। (श. सं. म. ख. २.१५७)

One *pala* of drug boiled in sixty four *palas* of water and reduced to half of the quantity then contents are filtered with cloth and obtained liquid is called *Auṣadha siddha pānīya* or *pānīyajala.*

Uses

This *auṣadha siddha pānīya* is used as a drink and also used for the preparation of *peya* etc.

Auṣadha siddha pānīya is to be considerd as one form of *kwātha kalpanā,* hence it is mentioned in

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the context of *kwātha kalpanā.*

यदप्सु शृतशीतासु षडङ्गादि प्रयुज्यते । कर्षमात्रं ततो द्रव्यं साधयेत् प्रास्थिकेऽम्भासि ।।
अर्धशृतं प्रयोक्तव्यं पाने पेयादिसंविधौ । (द्रव्यगुणविज्ञान, श्री यादव जी)

Sri Yādavaji in his *dravyaguna vijñāna* regarding *auṣadha siddha pānīya* mentioned like wise :

One *tola* of *auṣadha dravya* is made into coarse powder form and it is mixed with one *prasta* (64 *tola*) of water in a vessel and heated with *mandāgni* till it reduces the liquid quantity to half *prastha* then vessel is taken out from *koṣṭi* and contents are filtered with cloth, the obtained liquid is called *auṣadha siddha pānīya,* then after it cools, it is advised to take internally. According to the patients disease condition medicinal drug has to be selected. This is used for the preparation of *kwātha siddha yavāgu* etc.

Yūṣa Kalpanā

Auṣadha Siddha Yūṣa

Introduction

Water, *kwātha, swarasa, hima,* and *takra* etc. *Dravadraya's* are mixed with *Simbi-Dhānya* etc. except rice and cooked well. Obtained liquid portion is called *Yūṣa kalpanā.* In *Kāśyapa saṁhitā, khila-sthāna, Yūṣa nirdesīyam adhyāya* wide range of description is mentioned regarding *yūṣa kalpanā.*

For the preparation of *yūṣa, mṛdu vīrya dravya kalka,* is taken in 1 *pala pramāṇa* and *Śuṇṭī, pippalī* etc. *tīkṣaṇa vīrya dravyas* are suppose to be taken in 1 *karṣa pramāṇa* and mixed with 1 *prastha* of water in a vessel and boiled till up to, contents are reduced to 1/2 of the quantity or according to the need reduction can be done and after that, contents are filtered with cloth, then obtained liquid is called *Yūṣa kalpanā.*

The substance cooked with so many articles along with liquids except rice is called *Yūṣa* (soup) and cooked with rice' is *Yavāgu* (gruel).

Definition of Yūṣa

यूषधातुं वदन्ति ज्ञा द्रवीकरणपाकयोः द्रवीकरोति भोज्यानि पक्वः सद्यूष इत्यतः। (का. सं. खि. ४-१७-१८)

The wise call the root *yūṣa* for liquifaction and metabolization. In this way the cooked *yūṣa* liquifies the diets.

Yūṣa gunas

The *Yūṣa* is *rocana, dīpana, vṛṣya, svaravarnabalāgnikṛt, prasvedajanana, Puṣṭī* and *sukhakaram.* The *Yūṣa* suppresses *vāta* due to being *sneha* and *uṣnadravyas,* the *pitta* due to being *sneha* and *kaṣāya dravyas,* and the *kapha* due to being *uṣṇa, kaṭu dravyas.*

Yūṣa Bhedha

The *yūṣa* are said to be of two types based on addition of *sneha*–1. *Kṛta yūṣa* : Sufficient quantity of *sneha* and *lavaṇa, marīca, dālcini, pippalī* etc. *kaṭu dravya* are mixed and fried.

2. *Akṛta yūṣa:* It will be prepared without adding any *sneha, lavaṇa, kaṭu dravya.*

Varities of Yūṣa

25 Varities of *Yūṣa* are mentioned likewise :

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1. *Mudga Yūṣa*
2. *Virasika Yūṣa*
3. *Daḍima Yūṣa*
4. *Citraka Yūṣa*
5. *Āmalaki Yūṣa*
6. *Pañca kola yuktha saṅgrāhī Yūṣa*
7. *Pañca kola yuktha Dīpana Yūṣa*
8. *Dhānya Yūṣa*
9. *Kulatha Yūṣa*
10. *Phala Yūṣa*
11. *Puṣpa Yūṣa*
12. *Patra Yūṣa*
13. *Valkala Yūṣa*
14. *Pallava Yūṣa*
15. *Maha Yūṣa*
16. *Rāsna Yūṣa*
17. *Masūra Yūṣa*
18. *Chāngeri Yūṣa*
19. *Mūlaka Yūṣa*
20. *Punarnavā Yūṣa*
21. *Atibala Yūṣa*
22. *Guḍa-kāmbalika Yūṣa*
23. *Trikaṭu Yūṣa*
24. *Lasuna Yūṣa*
25. *Vastūka Śāka Yūṣa*

Sapta Muṣṭika Yūṣa

Apparatus required

Khalva yantra, vessel, cloth etc.

Drugs required

Kulatha	:	*1 part (Muṣṭika)*
Yava	:	*1 part (Muṣṭika)*
Kola	:	*1 part (Muṣṭika)*
Mudga	:	*1 part (Muṣṭika)*
Suṣkamūl (mūli)	:	*1 part (Muṣṭika)*
Śuṇṭhi	:	*1 part (Muṣṭika)*
Dhānyaka	:	*1 part (Muṣṭika)*
Water	:	*16 parts*

Procedure

Kulatha etc. 7 drugs are taken and made into *yavakūṭa cūrṇa* and taken into vessel, then mixed with 16 times of water and heated over *mandāgni,* till reducing the total contents up to $^1/_2$ of the quantity or 1/4th quantity (according to need) vessel is taken out from the fire and contents are filtered with a cloth and obtained liquid is called *sapta muṣṭika Yūṣa* because here each of the drug is taken in *muṣṭika* (fist) *pramāṇa.*

Karma

Sleṣma haram, vātaharam, khaṇṭha-hṛdaya-Mukha śodhana karam.

Āmayika Prayoga

Sannipātha Jwara, āma-vāta.

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Arka Kalpanā

Definition

Arka are distilled essences, which contain the volatile constituents of the drugs used in the preparation, in a medium of water and they are equivalent to the 'aquae' or 'waters' of the Western Pharmacopoeia, which are prepared in the same way. Some of the drugs which contains active principles in the form of volatile oil. Hence by using these drugs if *kwātha* is prepared while doing preparation itself active ingredients may get vapourised. *Arka kalpanā* can be prepared with such drugs e.g. *gulābipuṣpa, kevaḍa puṣpa, vedamuṣka, somph, candana, yavāni, khas, anantha mūla, pudhīna* etc.

Arka kalpanā stability period is comparitively more than *swarasa, kalka, kwātha, hima, phāṇṭa* and cūrṇa etc. and also *arka kalpanā* possess good palatability and attractive colour, hence its acceptency is more.

Method of Preparation

Arka is prepared by a process of distillation of water - soaked - raw drugs. The volatile principles which are evolved admixtured with water vapour are condensed and taken.

Apparatus required

Distillation apparatus (Arka yantra) :

The still consists of a basal receptacle to contain the drugs, and a cover with an exhaust tube which is conveniently bent to drain the distillate into the bottle. A cupular reservoir is provided at the region where the exhaust leaves the lid portion.

The receptacle of .the retort may be an earthen pot or preferably a metallic one. When made of metals like brass or copper, the interior should be tin coated. Iron should not be used because it gets rusted and corraded in a short period. Stainless steel stills are excellent. It is advisable to provide a perforated false bottom in the receptacle to keep the drug intended for extraction and to avoid charring. The cupular reservoir over the lid is filled with cold water during distillation and it serve as a sort of crude type of condensor. This crude devise could be replaced by a good condensor in the form of a water jacket around the exhaust tube, or even a spiral type of condensor could be provided.

Drugs Required

1. The essential drugs from which *arka* is to be obtained - 1 part

(*Arka* can be prepared by singel drug or compound form of drugs)

2. Sweet water - 10 parts

Process of Preparation

If wet and freshly collected drugs are used, then they have to be made into small pieces and if dry drugs are used for *arka kalpanā* then they have to be made into coarse powder form and soaked in 10 times of sweet water and mixed well with hands, the contents are kept for about 24 hours in tin coated copper vessel and then the contents should be transfered with water into the still for distillation which softens the drugs and releases the volatile principles during distillation.

Concentration

This whole *arka* is filtered with cloth and preserved. Thus produced *arka* is a suspension of the distillate in water having slight turbidity and colour, depending upon the nature of the crude drugs under going for the distillation, the *arka* will have characteristic odour.

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While doing *arka* preparation distillation apparatus should not be exposed with *tīvrāgni,* because boiling the drugs with excessive heat, water will get evoparised. There by spoiled *kwātha* like preparation is produced and also because of more heat, very soon the water content will get evoparised and there is a chance of burning and spoilage of *arka dravya,* then little bit *arka* is produced which contains improper taste, smell and which will not be up to mark.

If *arka* is possessing bad smell then it has to be fumigated with *dhūma* produced by *hingu, jīraka, methi, rai* etc. drugs powder mixed in *ghṛtha* and put in *navīnahaṇḍi.* Like this if fumigation is done frequently *arka* will loose its bad smell and develop good odour (flavour) and also this *arka* will get the capability of increasing the *Jaṭarāgni.*

The lid is tightly placed and sealed around to prevent vapours from escaping. For the purpose of sealing, a cloth ribbon with a paste of black gram is used. Heat is applied to the drug mixture and the distillate is collected in large bottles and mixed well to ensure uniform concentration of the medicine because the first distillate is much concentrated compared to that collected at the end of the process when the drugs are depleted of the medicinal principles. A continuous water current should be maintained in the condensor. When a cupular type of condensor is used, water is replaced by cool water as and when it becomes warmed up. The vessel or bottle in which the distillate is collected is placed in a container containing cold water (In large scale preparation, large stills which are heated by super heated steam are employed for distillation).

The end of the process of preparation is marked by the escape of dark fumes, from the exhaust. Further attempts to heat and collect the remnants of condensate should not be made once this phenomenon is noticed. Usually the volume of the distillate is 70% of the total volume of the drug and water mixture taken for distillation.

The whole of the distillate should be mixed to make a preparation of uniform concentration.

Storage and Usage of Arka

Arka should be stored in tightly stoppered glass bottles. Any *arka* if kept open and exposed to air will loose its volatile medicinal principles. Some physicians remove the oil drops in the *arka* and consider the oil as undesirable. Usually, the bottle is well shaken before use to mix the oil droplets with the *arka.* These oil droplets are in reality, medicinally important. *Arka* are mixed with equal quantity of water before use.

Expiry Date

I year

Mātra

Some of the commonly using *arka*

Yavanyādi arka	:	*Jwara, vamana, atisāra etc.*
Gulābi arka	:	*Atisāra*
Pañcakolādi arka	:	*Viśūcika*
Śuṇṭhyādhi arka	:	*Viṣamāgni*
Pāṇḍuhara arka	:	*Pāṇḍu*
Triphalādhi arka	:	*Kāmala*

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Pānaka Kalpanā

Usually *pānaka* is prepared by immersing the fruits in cold water, and rubbed with hands, then filtered product is called *pānaka kalpanā.*

Procedure

No I : *Pānaka* is prepared by utilising the fruits which have the *āmla, madhura rasa* e.g. *Anannāsa* (pineapple), *Āmra* (mango), *Parūṣaka* (grewia asiatica), *Cinca* (Tamarin), *Dāḍima, Drākṣa* (grape), orange, *Kharbūja* etc. fruits are fried or made in to paste form and mixed in 16 times of water, then rubbed with hands to dissolve their soft part in water, then contents are filtered with cloth, then *śarkara, śiṭā, marīca, ela.* sweetining agents and flavouring agents etc. according to need mixed and *pānaka* is prepared. This method usually applied for unripened fruits and which does not produces juice easily by squeezing.

No.2: Above mentioned ripened fruits juice is extracted separately and within that appropriate quantity of sugar candy or sugar and water are mixed and *pānaka* is prepared.

No.3: Usually juice is taken out from above mentioned ripened fruits, where as unripened fruits are cooked with fire or by pounding they are converted into paste form then only juice is extracted. In such conditions this juice is mixed with 16 times of cold water and *pānaka* is prepared.

No.4: Śarkara or *guḍa* and *āmlarasa pradhāna dravya* or *sugandhita dravyas* are mixed in water and *pānaka* is prepared. e.g. Lemon juice, sugar and water are mixed together and *pānaka* is prepared.

Āmayika Prayoga

Pittaja vyādhies, truṣṇa. dāha etc.

e.g.: 1. *Parūṣaka Pānaka,* 2. *Cinca pānaka,* 3. *Candana pānaka*

Cinca Pānaka

Reference

Anubhūta yoga

Apparatus Required

Khalva yantra, cloth, vessel, stirrer

Drugs Required

Ripened cinca phala (seedless)	:	*100 gms*
Water	:	*400 m.1.*
Sugar	:	*200 gms.*
Saindhavalvaṇa	:	*10gms*
Fried jīraka cūrṇa	:	*10gms*
Marica cūrṇa	:	*5 gms*

Procedure No.1

Water and *cinca phala* (seedless) are mixed with water in vessel and kept for one night and next day morning contents are rubbed with hands and filtered with the help of cloth, then sugar, *lavaṇa, jīraka, marīca cūrṇa* etc. are mixed in the filtered contents with the help of stirrer. While mixing first sugar has to be dissolved, then *lavaṇa, jīraka, marīca cūrṇa* etc. are mixed and obtained product is called *cinca pānaka.*

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Procedure No.2

Reference

Vṛdda vaidya

Drugs Required

Cinca phalamajja	:	12 gms.
Śītajala	:	192 ml.
Miśreya phalacūrṇa	:	appropriate quantity
Ela cūrṇa	:	appropriate quantity
Śarkara	:	appropriate quantity

Cinca phalamajja is grinded in *khalva yantra,* and *kalka* is prepared. This *kalka* is mixed with water in a vessel, rubbed with hands and filtered the contents with the help of cloth. Then *śarkara* is dissolved and *miśreya phala cūrṇa, ela cūrṇa* etc. are mixed in appropriate quantity.

Candana Pānaka

Reference

Anubhūta yoga

Apparatus Required

Khalva yantra, vessel, stirrer.

Drugs Required

Sweta candana cūrṇa	:	*100 gms*
Water	:	*100 ml.*
Sugar	:	*250 gms*
Lemon juice	:	*10m. I.*

Procedure No.1

Fine powder form of *sweta candana* is mixed with water and kept for one night, next day morning contents are rubbed with hands and filtered with cloth for 2 to 3 times. Sugar is mixed in filtered liquid and contents are made *pāka* over *mandāgni* (Test for proper *pāka* while making *pāka,* 1 or 2 drops of *pāka* should be droped in a another vessel, if those drops spreads, then some more time *pāka* has to be continued. If *pāka bindu* (drop) does not spreads, then that is the proper stage of *pāka* and heating process can be stopped at this level. Then lemon juice has to be mixed and contents are filtered). When it becomes some what concentrated form, contents are taken out from fire and filtered once again, obtained product is called *candana pānaka.* This is preserved in glass bottels.

Mātra : 2 to 4 t. s. f.

Anupāna : It can be taken along with water or it can be consumed as it is.

Āmayika Prayoga

Dāha, tṛṣna, mūtravikāra, upadamsa, jwara.

Procedure No.2

Reference

Vṛdda vaidya

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Apparatus Required

Khalvayantra, vessel, cloth.

Drugs Required

Śweta candana	:	12 gms
Śītajala	:	192 mI.
Śarkara	:	appropriate quantity
Miśreyaphala cūrṇa	:	appropriate quantity
Elacūrṇa	:	appropriate quantity

Take the fine powder of *sweta candana* and add water to it. The powder is rubbed with hands in water. Then filter the. contents and dissolve the required quantity of *śarkara,* then mix the *miśreya phala cūrṇa, ela cūrṇa* etc. and obtained product is called *candana pānaka.*

Śarkara Kalpanā

Śarkra kalpanā is a palatable liquid formulation and it is similar to the *śarbath*. Usually *gulab, banaphsa, vedamuṣka, śatapuṣpa, candana, kevaḍa puṣpa* etc. odorant drugs are used and *dāḍima, anannās* (pineapple), *phālsa* etc. fruits also used for the preparation of *śarkara kalpanā.*

Apparatus Required

Cloth, Khalva yantra, pātra

Drugs Required

Pounded dravya	:	1 part (1 pala/48 gms)
Water	:	8 parts (Astaguṇa)
Śarkara	:	4 parts (4 pala 192 gms)

Procedure No.1

Yavakūṭa cūrṇa of *dravya* is dipped in 8 parts of water and kept for one night. Next day morning, the contents are heated with *mandāgni* till the total quantity of the ocntents are reduced to 1/8th quantity (*aṣṭamāmsa*), then contents are filtered with cloth. 4 *pala* of *śarkara* is added to this filtered liquid and again slowely heated till *tantu-yukta pāka* is obtained and this is called *śarkara kalpanā.*

Procedure No.2

Dravadravya (Hima, phāṇṭa, kwātha, arka)	:	1 part
Śarkara	:	2 parts

Among *hima, phāṇṭa, kwātha, arka* etc. anyone of the *drava dravya* one part is taken and two parts of *śarkara* is added to that then heated with *mandāgni* (low temparature) till it attains proper *pāka.* Here *pāka* is observed till it attains *madhu* like consistence. After proper attainment of *pāka* vessel is taken out from fire, contents are filtered with cloth and obtained product is called *śarkara kalpanā* (during hot state only contents can be filtered through the cloth easily).

Concentrated form of *śarkara kalpanā* does not require any adding of preservatives. Preservatives can be incorporated in diluted form of *śarkara kalpanā.* At present commonly using preservatives for *Śarkara kalpanā* are sodium benzoate, potasiam meta bi-sulphide, saitric-acid, glycerin, methyl paraben, benzoic acid etc.

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Āmayika Prayoga

Truṣna dāha and *pittajavikāras*

Mātra : 25 ml. quantity of *śarkara* is mixed in 250 ml. of water while administration.

Expiry Period

If proper preservation and packing is done *śarkara kalpanā* can be kept up to 4 months to 1 year.

This type of formulations in Unani system of medicine is called as *Śarbath,* where as in modern pharmaceutics called as syrup.

Banapsa Śarkara

Apparatus Required

Stainless steel vessels, cloth, khalvayantra etc.

Drugs Required

Banapsa	:	I part
Śarkara	:	4 parts
Water	:	8 parts

Procedure

One part of *Banapsa* is made in to *yavakūṭa cūrṇa* and it is dipped in 8 parts of water in a vessel and kept for one night. Next day morning vessel is kept over fire and heated with *mandāgni* till total quantity of contents are reduced to 1/8th part, then contents are filtered and 4 parts of *śarkara* is dissolved in obtained liquid. This total mixture of liquid is again heated with *mandāgni,* till it attains proper *pāka.* After attaining the proper *pāka,* contents are filtered during hot state only, then obtained liquid formulation is called *Banapsa śarkara,* when it becomes cool, it should be filled in glass containers.

Mātra : 25 ml. quantity of *banapsa śarkara* is mixed in 250 ml. of water, while administration.

Āmayika Prayoga

Pitta jwara, jīrna jwara, pratisyāya, kāsa, swāsa, śirahśūla. sukumāra type of patients suffering with *pitta jwara,* if they are. not able to consume the medicine having *kaṭu, kaṣāya rasa* etc. for such patients *banapsa śarkara* is advised, for the relief from *pittawara.*

Parūṣaka Śarkara

Apparatus Riquired

Stainless steel vessels, cloth, *khalvayantra* etc.

Drugs Required

Parūṣaka phalarasa	:	1 lit.
Śarkara	:	2 kg. to 4 kg. (according to requirement)

Procedure

Mentioned quantity of *parūṣaka phalarasa* and *śarkara* are collected in a vessel, then it is heated over *mandāgni* till it attains *madhu* like consistence (*pāka*), then contents has to be filtered with cloth, and if required preservatives can be incorporated. Then obtained liquid is called *parūṣaka śarkara.* This has to be preserved in glass bottels.

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Karma

Dīpana, pācana.

Āmayika Prayoga

Mandāgni. pratisyāya, jwara. kāmala, pāṇḍu.

Syrups

Syrups are the sweet, viscous, concentrated aqueous solutions of sucrose or other sugars in water or any other suitable aqueous vehicle. When purified water alone is used in making the solution of sucrose the preparation is known as syrup or simple syrup. When the preparation contains some medicinal substance it is known as medicated syrup. When the syrup does not contain any medicament but contains various aromatic or pleasantly flavoured substances are known as flavouring syrups. They are used for masking the disagreeable taste of bitter or saline drugs. They are also used as vehicles or flavours for extemporaneous preparations.

In addition to sucrose, certain other polyols, such as glycerin, sorbitol or other polyhydric alcohols may be added in small amounts to retard crystallization of sucrose or to increase the' solubility of other added ingredients.

In the manufacture of syrups the sucrose and purified water free from foreign substances should be selected and clean containers must be used to avoid contamination during preparation. Dilute solutions of sucrose support mold, yeast and other microbial growth whereas the growth of such micro organisms is usually retarded when the concentration of sucrose is 65% weight by weight or more but a saturated solution may lead to crystallization of sucrose.

Only small quantities of syrups should be prepared which can be used within a few months. If large quantities are to be prepared then they must be preserved well to prevent contamination. Syrups can be well preserved at a temperature not exceeding 25^{0}C. In dilute solutions preservatives like glycerin, methyl paraben, benzoic acid and sodium benzoate may be added.

Now a days artificial syrups prepared from artificial sweetening agents are available in the market. They have the advantage over syrups prepared from sugars that they do not contain any carbohydrate therefore can be easily given to diabetic patients, moreover they have lesser stability problems than sugar based syrups.

Elixirs

Elixirs are clear, pleasantly flavoured, sweetened hydroalcoholic liquid preparations for oral administration. The main ingredients of elixirs are ethanol and water but glycerin, sorbitol, propylene glycol, flavouring agents, sugar and preservatives may be incorporated to the preparation. The elixirs may be medicated or non-medicated. The medicated elixirs usually contain very potent drugs such as antibiotics, antihistaminics and sedatives. The bitter and nauseous taste of certain drugs can be masked by adding flavouring and sweetening agents. The non-medicated elexirs are used as flavours and vehicles.

Linctuses

Linctuses are sweet, viscous liquid preparations usually containing medicinal substances which have demulcent, sedative or expectorant properties. They are used for the treatment of cough. They produce soothening effect on the mucous membrane of the throat. To obtain the maximum effect they should be taken in small doses, sipped and swallowed slowly without the addition of water.

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Pramathya

Pramathya word is derived from upasarga *'pra'*. Here *'Pra'* means *prakarṣena,* it indicates the churning process wich is done in *pramathya.* This is modified form of *kwātha kalpanā.* This is mainly *pācana. dīpana kaṣāya.*

One *pala* of drug (grinded and made in to *kalka* form) in eight parts of water taken in a vessel and boiled over *mandāgni* till total quantity reduced to quarter and filtered with cloth, then obtained liquid is called *pramathya* (here medicinal drugs are made into *kalka* and by using it, *kwātha* is prepared and called as *pramathya.* Because drug is allready prepared in to *kalka* form before making *kwātha,* hence there is a chance of dissolution of more active principles in water (i.e *pramathya),* hence *pramathya* may be a more concentrated form than usual *kwātha kalpanā.* But here *pramathya mātra* is 96 ml., which is seems to be more quantity. Nowadays on the basis of digestive power of the patients, *pramathya mātra* can be reduced to 2 *tola* to 4 *tola).*

Mātra : Two palas

Difference Between Kwātha and Pramathya

	Kwātha	*Pramathya*
1.	In *kwātha* preparation coarse powder of drug is used.	In pramathya preparation *dravya kalka* is used for *kwātha* preparation.
2.	*Kwātha*	*Prakarsena Kwātha*
3.	*Akrutayūṣa*	*Kruta yūṣa.*
4.	In all stages of *doṣa*'s it is used.	It is used in *madhyadoṣas* (*madhyamāvastha* of *doṣas*)
5.	*Kwātha* can be used for the purpose of *samśodhana, samśamana, dīpana, pācana.*	Pramathya is used in the form *dīpana-pācana kaṣāya.*

Pramathya is advised in *madhyamāvastha* of *doṣas* and it is given in the form of *dīpana, pācanakaṣāya.* According to the *vriddavaidya parampara* (Where as *kwātha* is used for the purpose of *samśodhana, samśamana, dīpana, pācana* etc. Hence *kwātha* can be considered as one of main *Auṣadha kalpanā* and *pramathya* can be considered as one of the *pathyakalpanā).*

In *Aṣṭāngasaṇgraha* also under the context of *atisara cikitsa,* while explaining about *magadyadi pramathya* and *jaladādi pramathya,* it is clearly mentioned that, these *pramathyas* can be administered during *madhya doṣāvasta* of *atīsāra.*

According to *Ācārya Aruṇadatta kwātha* is considered as *Akṛta yūṣa,* where as *pramathya* is considered as *kṛtayūṣa.* Because drug is made in to *kalka* form, then *kwātha* is prepared, hence *pramathya* is called *kṛtayūṣa.*

Phāṇitha, Avalehya, Rasakriya, Ghana

These *kalpanāś* are having many pharmaceutical similarities with each other. *Phāṇṭa* is some what less concentrated form than *avalehya.* More concentrated form than *avalehya* and which can be made into *guti* form, is called *ghana.*

Phāṇita

Swarasa or *kwātha* etc. with appropriate quantity of sugar "is boiled till it gets concentrated form like *madhu* and is called *phaṇita.* [Sugar cane juice after filtering with cloth and this juice is made *pāka*

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in *loha pātra, pāka* is made, till it reaches the equal consistence of *madhu*. Then it is taken in to earthen pot: This product also called *phaṇita* (one type of *ikṣu-vikāra*)]

Dose, anupāna and mode of administration etc. are applicable same as mentioned to that of avalehya.

Rasakriyā

Even though *avalehya, lehya* are considered as synonyms of *Rasakriya* by *Ācārya śāraṅgadhara*, but slight variation in their pharmaceutical preparation can be recognised.

क्वाथदीनां पुनः पाकाद् घनत्वं सा रसक्रिया । (शा. सं. म. ख. ८.१)

Kwāthādi (*swarasa, kwātha,* et c) are boiled down to a thick consistency. Eg-*Guḍūci ghana. rasānjana* (*rasotha*), *mūsāmbara, khadira sāra* etc.

Method of Preparation

Kwātha etc. are boiled over *mandāgni* till it reaches the thick consistency. Then contents are collected in to tray and spread uniformely and exposed to sun light for 10 - 15 days. When all the water content is get evaporated, then medicine moulded in to *guṭikā* form if necessary.

Mātra

स्यात्तन्मात्रा स्यात्पलोन्मिता ।। (शा० सं० म० ख० ८.१)

1 Pala (48 gms)

Ācārya yādavaji mentioned the one *karṣa mātra* (12 gms) for *rasakriya* and *avalehya*.

Hence it can be understood that *rasakriya* or *avalehya mātra* 12 gms to 48 gms can be given according to the patient stregnth, disease state and also it can be given in divided doses for 24 hours.

In Āyurvedic .literature different varieties of *rasakriya kalpanās* are mentioned, among those.

1. Rasānjana (Rasotha), 2. Musambar

लेहस्य तन्तुमत्ताऽप्सु मज्जनं सरणं न च । अङ्गुल्या पीडिते मुद्रा गन्धवर्णरसोद्भवः ।।

(आचार्य यादवजी ६.१)

सालसारादिसारेषु पटोलत्रिफलासु च । रसक्रिया विधातव्या शोधनी शोधनेषु च ।। (सु. सू. ३६.२०)

रसक्रिया फाणिताकृतिः, 'काकवी' इति लोके । रसक्रिया कल्पना चेयम् । द्रव्यापेक्षयाऽष्टगुणं षोडशगुणं वा जलं दत्त्वाऽष्टभागावशेषः षोडश भागावशेषो वा क्वाथः कार्यः । मतः पूतं कषायं पुनस्तावत् पचेद्यावत् फाणिताकृतिः । (डल्हणः, सु. सू. ३६.२० की टीका)

Rasānjana

दार्वीक्वाथसमं क्षीरं पादं पक्त्वा यदा घनम् । तदा रसाञ्जनं ज्ञेयं तन्नेत्रायोः परमं हितम् ।।

(भा. प्र. हरि. २०३)

दार्वीक्वाथमजाक्षीरं पादं पक्व यदा घनम् । तदा रसाञ्जनं ज्ञेयं तन्नेत्रायोः परमं हितम् ।।

(आयु. प्र. ३)

In *Bhāvaprakāśa,* regarding processing method and pharmacological actions of *rasānjana* are mentioned like wise :

One part of *dāruharidra* is made in to *yavakūṭa cūrṇa* and it is dipped in 16 times of water in a vessel for one night, next day moming contents are heated over *mandāgni* till the total quantity of contents are reduced to 1/6th part (*kwātha*), then the contents are filtered with cloth, equal quantity to

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this obtained *kwātha,* cow's milk is mixed in a stainles steel vessel, and again heated over *mandāgni* till it becomes into concentrated form. Then this is collected in a tray and dispersed uniformely, then exposed to sunlight for some days till it becomes completely dry. This obtained product is called *rasānjana* some of the scholars of *Āyurveda* mentioned that one part of *dāruharidra kwātha* is mixed with 14 times of goat milk, then made in to *pāka* (concentrated form) and it is collected in to the tray and dispersed uniformely and made in to dry form by exposing with sun light.

Nowdays in market *rasānjana* prepared without adding milk also available.

Uses

This is used for application in the eye.

Mosabbar (Elua)

Well formed *ghṛta kumāri patra* are collected and removed the external thin layer and their internal soft, transparent part is collected in to wide mouthed *loha pātra* and it is heated with *mandāgni* till contents becomes in to the consistence equal to the *avalehya.* then contents are collected in to a tray and dispersed uniformely, then dried in sunlight for 10 days. Obtained product is called *mūsāmber.* It will be in shiny black colour and it breakes easily. It will be in crystal form and having punjent odour (*tīkṣṇa ganḍha*). It is called *musabbar* in unāni system of medicine.

At present in market adultrated (with grass, soil etc.) *mosabbar* is also available, hence it has to be used carefully after properly cleaning with hot water etc.

Some of the Common Rasakriyas with their Karma and Āmayikaprayoga

Name	*Karma and Āmayika prayoga*
1. *Khadira rasakriya*	*Vraṇaśodhaka, ropaṇa, kuṣta,*
2. *Udumbara rasakriya*	*Vrana ropana, pradahasamaka*
3. *Elua (Ghṛta kumāri rasakriya)*	*Mṛdurecaka, pācaka, pāma, vraṇa, vamana, tṛṣṇa, kāsa, aruci; hṛdroga*
4. *Triphala rasakriya*	*Vibhanda*
5. *Guḍūci rasakriya*	*Jwara*

Guḍa Pāka

यदा दर्वीप्रलेपः स्यात् यदा वा तन्तुली भवेत् । तोयपूर्णे च पात्रो तु क्षिप्तो न प्लवते गुडः ।।
क्षिप्तस्तु निश्चलस्तिष्ठेत् पतितस्तु न शीर्यति । एष पाको गुडादीनां सर्वेषां परिकीर्तितः ।।
सुखमर्द्दः सुखस्पर्शी गन्धवर्णरसान्वितः । पीडितो भजते म्रद्रां गुडः पाकमुपागतः ।।

(वै. प. प्र. २.५२-५४)

In *Āyurvedic classics, guḍa pāka* is mainly mentioned for the treatment of *bhagandara, arśoroga* treatment and also it is mentioned for the treament of other diseases too.

For the preparation of *Guḍa pāka, kwātha* is prepared with prescribed medicinal drugs according to that formulation and by utilizing this *kwātha* and *guḍa, pāka* is prepared and called as *guḍa pāka,* otherwise fine powder of medicinal drugs is mixed with *pāka* which made up of *guḍa.* According to necessity *triguṇa, ṣaḍguṇa* etc. quantity of *guḍa* should be taken for the preparation.

Guḍa Pāka Siddha Laksaṇa

Guḍa when it attains proper *pāka,* it sticks to *darvī* (stirrer), it will come up thread like (if taken out with a rod).

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If little quantity of *guḍa pāka* is poured in a vessel filled with water, then it floats without any movements.

It will have soft consistence.

Gaṇdha, varṇa, rasa partaining to the medicine will be produced.

Guḍa pāka if rolled and compressed in between fingers then finger print is produced.

Administration

Because of its palatability, its acceptence is more. It is useful for throat.

Mātra : I karṣa

Anupāna

Cold water, milk.

Guḍa (Jaggery, Saccharum Officinarum)

Introduction

Sweetening substances basically serves as a base in *avalehya kalpanā* and some times it also provides palatability to formulation. They are in dietic value and having their own pharmacological activities too. In *Āyurveda* various sweetening agents used are *guḍa, sita, khaṇḍa śarkara, śarkara* etc. Among these *guḍa* (jaggery), *sita* (purified sugar-candy), śarkara (sugar) are very commonly used for the preparation of different *kalpanās* i.e. *avalehya, guṭikā, āsava* and *ariṣṭa kalpanās* etc.

Many times while explaining their quantity for the preparation of different *kalpanās* (e.g. for the purpose of *avalehya* preparation, if sweetening substance is taken as *guḍa,* then its quantity should be two parts to that of drug.

If sweetening agent is choosed as *guḍa* for the formulation, then its quantity will be less with comparitively *śarkara.* This is because richness of pharmacological actions in *guḍa* and its concentration form, so that more concentrated, thick *pāka* can be obtained from *guḍa* with comparing to *śarkara pāka.*

Because of all these considerations *guḍa* quantity may be mentioned as less with comparing to the *śarkara* quantity by *Ācārya śāraṅgadhara.*

Jaggery is explained under the heading of *ikṣu varga* in all *saṁhitās* and *nighaṇtus.* It is prepared by the juice of sugarcane. Before the formation of jaggary the sugarcane juice undergoes four stages i.e., *Ardhāvaśeṣita* when only half of the juice remains in the process of boiling, *tribhāgāvaśeṣita* (when one third remains), *caturbhāgāvaśeṣita* (when one fourth of the portion remains). All these three varities are called as *'kṣudra guḍa'* these are heavy for digestion in their ascending order. The finally formed *guḍa* will be clean and good quality, it is called as *ahouta guḍa* and used for medicinal as well as dietic purposes. It is one of the most wholesome diets for human being. It's efficacy increases with its years. Old jaggery is considered to be good for *hridaya* and *pathya,* whereas new jaggery causes *kapha vṛddhi* and *agni māndhya.* It is sweet in taste and not too cooling. It acts as a demulcent and purifier of the blood.

Jaggery acts as *tridoṣghna* when administered with different *anupānas.*

The different modifications of treacle such as the *matsaṇḍika, khaṇḍa śarkara* which are progressively more refined should be deemed as gaining more in their cooling, demulcent and aphrodisiac properties and getting heavier in digestion in each of successive stages of refinement.

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Qualities of sweetening substances mentioned in *Bhāva prakāśa* as followes :

During the process of sugarcane juice, solid substance obtained called as *matsyaṇḍi* and this is called *guḍa* (jaggery).

Pharmacological Characters of Guḍa

Guṇa - Guru, snigdha

Karma - Vātahara, vṛṣyam, mūtraśodhanam, balakaram, increases medodhātu, kapha and krimi.

Pharmacological Characters of Navaguḍa (New Jaggery)

Newly prepared jaggery increases *kapha* and causes *śwāsa, kāsa, kṛmi* and increases *agni.*

Pharmacological Characters of Purāṇa guḍa (Old Jaggery)

It is *laghu, pathyam,* not *abhīṣyandi, agnivṛddikaram, pittaharam, madhuram, vṛṣyam, vātaharam, rakta doṣa haram.*

Pharmacological Charactets of Khaṇḍa Sarkara

Khaṇḍa śarkara is *madhuram, vṛṣyam, cakṣusyam, bṛmhaṇam, hitakaram, vāta pitta haram, snigdam, balakaram, vānti haram.*

Pharmacological Characters of Śarkara (Sugar)

Śarkara recembles as sand, and it is *madhuram, rucikaram, vāta haram; rakta pitta haram, dāhaharam, mūrcha haram, vānti haram, jwara haram, sukra karam, and having śīta vīrya.*

Pharmacological Characters of Sita or Sitopala (Purified Sugar Candy)

Sita (sugar candy) is *śīta guṇa yuktam raktapittaharam,vāta pitta haram and having laghu, sara guṇas.*

Avalehya kalpanā (Confections)

Introduction

Avalehya or *lehya* is intended for internal administration and it is semi solid preparation of drug by the addition of jaggery, sugar or sugar candy and boiled with prescribed drug decoction or drug juice etc. liquids. It can be consumed along with some *Anupāna.*

The word *Avalehya* has been originated from the *Lih Āswadane,* here *Lih* is *Dhātu* and *Āswadane* is the *Kriya. Lehya* is one among the four types of food items, they are *Peya, Leha, Bhakṣya* and *Charvya.*

Totally that means, the substance which is taken by licking (chewing) with good palatability. This indicated the metabolism and absorption of this pharmaceutical dosage form starts from the mouth itself, because of presence of more quantity of glucose, fructose etc. sweetening agents. *Avalehya's* acceptency is more with comparing to other varieties of *Āyurvedic* dosage forms.

Avalehya if required can be considered as an *Upakalpanā* of *Kwātha* since *Śāraṅgadhara* has given at most importance to *Kwātha* in his scriptures. In todays world *Avalehya* is gaining rapid importance since it is easily consumable and has rich in taste and also as it is having daitic value. It can be. compared with confections, electuries, conserves of *British Pharmacopoeia.*

The word *Avalehya* has different synonyms like *Leha, Rasakriya, Lehya, Avalehya* and *Avaleheka*

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etc. *Ācārya Śāraṅgadhara* mentioned that, *rasakriya* as a synonym of *leha,* but *Dalhaṇa* disagrees with it. He says that *Rasakriya* is a preparation similar to that of *Phāṇita* is known by a general term *Kākavi.*

रसक्रिया फाणिताकृतिः 'काकवी' इति लोके । (सु. सू. ३७/२० की डल्हण टीका)

क्वाथादीनां पुनः पाकाद् घनत्वं सा रसक्रिया । सोऽवलेहश्च लेहः स्यात् तन्मात्रा स्यात्पलोन्मिता ।।

(शा. म. ८.)

The solid mass that is obtained as a result of boiling *Kwāthādi* (that is *Kwātha, Swarasa, Hima, Phāṇta* etc.) is known as *Rasakriya.* It has synonyms like *Avalehya* or *Leha.* Its *mātra* is one *pala* (48 *gms).*

Method of Preparation

Equipment Required

The drug enumerated in the recipe.

A wide mouthed stainless steel vessel or a similar vessel made of other metals, tinned inside.

Strong spatulae for mixing the medicine during preparation.

Fine sieve or fine cloth.

In factories preparing these medicines on a large scale, the heating is carried out by super heated steam jacketed vessels.

The mixing is done by electrically operated mixing machines, sieving is done by mechanical sifters.

Process of Preparation

The component drugs which enter in to the composition of *leha* are capable of being classified in to the following.

The major drugs which are of prime importance (powders or pulps of certain drugs).

The sweetening agents -these includes sugar, sugar candy and jaggery.

Ghee keeps the *lehya* soft and preserves it.

Flavouring agents.

The liquid media, these may either be infusions or juice or simply water.

लेहे यत्रास्ति यो भागोऽनिर्दिष्टो द्रवकल्कयोः । तत्रापि पादिकः कल्को द्रवात्कार्यो विजानता ।।

(latro-Chern. of Ayu. R.S. 1.221)

According to *Thodaramalla,* if the ratio of *drava dravya* and *Kalka* of drugs in a recipe of *Avalehya* is not specified, then the *kalka* should be taken 1/4th in quantity of the *drava dravya.*

Quantity of Sweetening Agents

सिता चतुर्गुणा कार्या चूर्णाच्च द्विगुणो गुडः । द्रवं चतुर्गुणं दद्यादिति सर्वत्र निश्चयः ।। (शा. म. ८.२)

If sugar candy is used as a sweetening agent its quantity should be four times the quantity of drug. In case of jaggery, it should be double the quantity and if liquids are used their quantity should be four times.

तुलाद्रव्यं जले द्रोणे द्रव्यं तुला मता । देयो गुडः सिता वापि इति सर्वत्र निश्चितम् ।।

(latro-Chern. of Ayu. R.S. 1.222)

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In the preparation of *lehya,* if one *tula* of drug is prescribed to be used,. then this should be boiled in one *droṇa* of water: Similarly, if the quantity of drug "is not specified in the recipe, then one *tula* of the drug should be taken and boiled in one *droṇa* of water. To this decoction, jaggery and sugar should be appropriately added and the *lehya* should be prepared.

The major drugs are dried, finely powdered and sieved through a fine clean cloth individually as well as collectively. The ingredients mentioned in *yoga* are taken and made in to *kaṣāya,* guḍa, śarkara or sita etc. are added and it is filtered once more to remove the foreign particles. It is then kept over *mandāgni* and subjected to continuous stirring till it reaches a semisolid stage and form thread like extensions when pressed and drawn between the thumb and index finger.

Pāka lakṣanas of Avalehya

सुपक्वे तन्तुमत्त्वं स्यदवलेहोऽप्सु मज्जति । स्थिरत्वं पीडिते मुद्रागन्धवर्णरसोद्भवः ।। (शा. म. ८.३)

According to *śāraṅgdhara,* well prepared *Avalehya* should come up as thread like (if taken out in rod), sink in water, takes finger prints are shapes if rolled between fingers, give pleasant smell possess good colour and taste.

Vāgbhaṭa has explained these points more detail,

सुखमर्दः सुखस्पर्शो गन्धवर्णरसान्वितः । पीडितो भजते मुद्रां गुडपाकमुपागतः ।।
यदा दर्वीप्रलेपः स्याद्यावद्वा तन्तुली भवेत् । तोय पूर्णो यदा पात्रे क्षिप्तो न प्लवते गुडः ।।
क्षिप्सस्तु निश्चलं तिष्ठेत्पतितस्तु न शीर्यति । एषः पाको गुडादीनां सर्वेषां परिकीर्तिताः ।। (वाग्भट)

Signs of proper pāka of lehya (Guḍa Pāka) are as follows

तोयपूर्णे यदा पात्रे क्षिप्तो न प्लवते गुडः । क्षिप्तस्तु निश्चलस्तिष्ठेत् पतितस्तु न शीर्यते ।
एष पाको गुडादीनां सर्वेषां सम्प्रकीर्तितः ।। (द्र. गु. वि. आचार्य यादवजी)

It should be soft in rubbing

It should be soft in touch.

It should possess appropriate smell, colour and taste:

If it is pressed between the two fingers, then finger print should be appeared over the paste.

The *pāka* should stick to the stirrer (Darvī Pralepa). Thread should appear when a small portion of the *pāka* is lifted out of the vessel.

If a small portion *of* the *pāka* is placed on a cup filled with water, it should not float, it should remain stable in water and it should not get dissolved in water.

According to Bhela

रसक्रियाद्या ये लेहाः गुडाश्चैव प्रकीर्तिताः । तेषां बिन्दुर्जले न्यस्तौ न शीर्येत्पक्वलक्षणम् ।।

(Iatro-Chem. of *Āyu*. R.S. 226)

If a drop of *Rasakriya, lehya* or *guḍa pāka* is put in water and it does not get dissolved, then it is the sign of proper *pāka* of these preparations.

These all above criteria indicates the. proper *pāka* of *lehya.* On the basis of this identifying parameter when *guḍa* etc. reaches proper *pāka* state, during that time drug powder has to be incorporated, so that proper *Avalehya* will be prepared.

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"Different concepts regarding adding of the drug powder (Prakṣepa cūrṇa) to the pāka while preparation of Avalehya

According to Ayurvedic formulary of India, Pharmocopial standards of *Ayurveda* and *Abhinava Bhaiṣajya Kalpanā Vijñāna,* the drug powders (in fine powder form) has to be added in small quantities and stirred continuously and vigorously to form a homo-genous mixture immediately after removing the vessel from the fire.

According to *Viadya yoga ratnavali* and Andhra Pradesh Pharmacopoeia, the drug powder has to be added after getting *pāka lakṣaṇa* while heating (with low temperature) for a short period.

This concludes that, if more quantity of *Dravya cūrṇa* are described in the particular recipe then *dravya cūrṇa* is added little by little, while heating with *mandāgni.* If the quantity of *dravya cūrṇa* is less then it can be mixed after removing the vessel from the fire. Usually Prakṣepa dravya cūrṇa will be mixed after taking they vessel from fire. This is because most of the Prakṣepa dravya containing volatīle principles and they get evaporated with more temperature and also prolonged heating will result in a hard mixture.

Ghee or oil if mentioned, is added while the preparation is still hot and mixed well. *Madhu* (honey), if mentioned is added when the preparation is cool and mixed well.

When metals are mentioned, the *bhasmas* of those metals are used. If poisonous drugs are mentioned like *Bhallātaka,* purification should be done before their adding. *Ācārya Siddhi Nandan Mishra* explained another type of preparation which is given below:

Swarasa or *Kwātha* is further made in to a paste form by boiling and then *cūrṇādi prakṣepa dravya* are added to it. The whole mixture is then kept in a clean vessel. Here we are not using guḍa etc. Due to the absence of such sweetening agents the *avalehya* can not be preserved for long and has to be used with in a short span of time. This can be practiced for the treatment of *Madhumeha* like manifestations where intake of sugar is prohibited.

Preservation and storage

The *lehya* should be kept in wide mouthed glass or porcelain jars. It can also be kept in a metal container, which does not react with it. Normally *lehya* should be used within one year. This shelf life is depends on the quantity of *guḍa, śarkara* added in the preparation. The colour and smell of the finished product depends on the drugs used for the particular recipe.

Mātra : 6-12 gm. (Commonly prescribing dose of *avalehya).*

Different scholars of *Āyurveda* mentioned regarding mātra of avalehya like Viz :

.....तन्मात्रा स्यात्पलोन्मिता ।। (शा. म. ख. ८.१)

According to śāraṅgadhara one *pala* (48 gms) is the dose.

लेहस्य मध्यमा मात्रा कर्षमाना प्रकीर्त्तिता ।।

But according to Yādavji, it is 1 karṣa (12 gms)

अवलेहश्च लेश्च तस्य मानं पलद्वयम् ।।

According to *Todaranānda,* it is two *pala* (96 gms.)

This seems that *Ācāryas* might have mentioned according to *agni bala (pravara, madyama, avara)* the dose of *Avalehya* has to be *two palas, one palas, one karṣa* respectively.

This quantity also can be taken in three to four divided doses in a day. This also indicates that,

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according to the variety of avalehya (depending upon variation of drugs), disease condition, and also prakruti etc, the dosa can be altered, Here reason for mentioning more quantity of dosa may be because of dietic value of *avalehya.*

Anupāna

According to śāraṅgdhara,

दुग्धमिक्षुरसो यूषः पञ्चमूलीकषायजम् । वासाक्वाथो यथायोग्यमनुपानं प्रशस्यते ।। (शा. सं. म. खा. ८.४)

Milk, sugar cane juice, *yūṣa, pañcamūla kaṣāya, vāsa kaṣāya* are good vehicles.

According to *Ācārya Yādavji Trikamji :*

दुग्धं यूषं कषायश्च जलं फलरसस्तथा । लेहानामनुपानार्थं यथाव्याधि प्रशस्यते ।। (द्र. गु. वि. उत्त. पृ. ४५)

Milk, yūṣa, kaṣāya, water, phala rasa are to be used as vehicles according to diseases.

Avalehya sevana kāla

ऊर्ध्वजत्रुरोगघ्नी सायं स्यादवलेहिका । अधोरोगहरी या तु सा पूर्व भोजनान्मता ।। (भै. र. ज्वर. प्र. १३१)

If the patient is having the disease in *Urdwajatrugatha bhāga, Avalehya* should be given *sāyamkāla* (evening time) with proper *anupāna,* but if the disease is affected to *Adhobhāga*, taking *leha* before food is better, according to *Bhaiṣajyaratnāvali.*

Amṛta Bhallātak

सुपक्वभल्लातफलानिसम्यग् द्विधाविदार्याढकसंमितानि ।
विपाच्यतोयेन चतुर्गुणेन चतुर्थशेषे व्यपनीय तानि ।।
पुनः पचेत्क्षीरचतुर्गुणेन घृतांशयुक्तेन घनं यथा स्यात् ।
सितोपलाषोडशभिः पलैस्तु विमिश्र्यसंस्थाप्यदिनानि सप्त ।।
ततः प्रयोज्याग्निबललेन मात्रांजयेद्गुदोत्थानखिलान्विकारान् ।
कचान् सुनीलान् धनकुञ्चिताग्रान् सुपर्णदृष्टिंसुकुमारतां च ।।
जवंहयानां च मतङ्गजं बलं स्वरं मयूरस्य हुताशदीप्तिम् ।
स्त्रीवल्लभत्वं लभते प्रजां च नीरोगमब्दद्विशतानिचायुः ।।
न चान्नपाने परिहार्यमस्ति न चातपे चाध्वनि मैथुने च ।
प्रयोगकाले सकलामयानां राजाह्वयं सर्वरसायनानाम् ।।
भल्लातकशुद्धिरिह प्रागिष्टचूर्णगुण्डनात् । घृताच्चतुर्गुणं क्षीरं घृतस्य प्रस्थ इष्यते ।।

(भै. र. रसायन प्रकरणम्; ७३/१७६-१८१)

Ingredients

1. *Suddha Bhallātaka*	-	7.46 kg
2. *Godugdha*	-	29.84 lit
3. *Goghṛta*	-	7.46 kg
4. Water	-	29.84 lit
Reduced to	-	7.46 lit
5. Sugar	-	1.53 kg

Dose : 6 *māṣa* to 2 tola

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Anupāna : Water

Therapeutic uses : *Rasāyana, vajikāraṇa.*

Cyavanaprāśa

बिल्वोऽग्निमन्थः श्योनाकः काश्मर्यः पाटलिर्बला । पर्ण्यश्चतस्रः पिप्पल्यः श्वदंष्ट्रा बृहतीद्वयम् ।।
श्रृंगी तामलकी द्राक्षा जीवन्ती पुष्करागुरुः । अभया चामृता ऋद्धिर्जीवकर्षभकौ शटी ।।
मुस्तं पुनर्नवा मेदा सैला चन्दनमुत्पलम् । विदारी वृषमूलानि काकोली काकनासिका ।।
एषां पलोन्मितान् भागाञ्छतान्यामलकस्य च । पञ्च दद्यात्तदैकध्यं जले द्रोणे विपाचयेत् ।।
ज्ञात्वा गतरसान्येतान्यौषधान्यथ तं रसम् । तच्चामलकमुद्धृत्य निष्कुलं तैलसर्पिषोः ।।
पलद्वादशके भृष्ट्वा दत्वा चार्धतुलां भिषक् । मत्स्यण्डिकायाः पूताया लेहवत्साधु साधयेत् ।।
षट्पलं मधुनश्चात्रा सिद्धशीते प्रदापयेत् । चतुष्पलं तुगाक्षीर्याः पिप्पली द्विपलं तथा ।।
पलमेकं निदध्याच्च त्वगेलापत्रकेशरात् । इत्ययं च्यवनप्राशः परमुक्तो रसायनः ।।
कासश्वासहरश्चैव विशेषेणोपदिश्यते। क्षीणक्षतानां वृद्धानां बालानां चाङ्गवर्धनः ।।
स्वरक्षयमुरोरोगं हृद्रोगं वातशोणितम् । पिपासां मूत्रशुक्रस्थान् दोषाञ्चाप्यपकर्षति ।।
अस्य मात्रां प्रयुञ्जीत योपरुन्ध्यान्न भोजनम् । अस्य प्रयोगाच्च्यवनः सुवृद्धोऽभूत्पुनर्युवा।।
मेधां स्मृतिं कान्तिमनामयत्वमायुः प्रकर्ष बलमिन्द्रियाणाम् । स्त्रीषु प्रहर्ष परमग्निवृद्धिं वर्णप्रसादं पवनानुलोम्यम् ।।
रसायनस्यास्य नरः प्रयोगाल्लभेत जीर्णोऽपि कुटीप्रवेशात् । जराकृतं रूपमपास्य सर्व बिभर्ति रूपं नवयैवनस्य ।।

(च.सं.चि. १/६२-६९)

Apparatus required : Avalehya Pātra, Khalva yantra, stirrer, cloth, vessels etc.

Ingredients

1. *Bilva*	40 Gms.
2. *Agnimantha*	40 Gms.
3. *Śyoṇāka*	40 Gms.
4. *Kāśmaray*	40 Gms.
5. *Pāṭala*	40 Gms.
6. *Balā*	40 Gms.
7. *Śalaparṇī*	40 Gms.
8. *Pṛśniparṇī*	40 Gms.
9. *Māṣaparṇī*	40 Gms.
10. *Mudgaparṇī*	40 Gms.
11. *Pippali*	40 Gms.
12. *Śvadaṁṣṭrā*	40 Gms.
13. *Bṛhatī*	40 Gms.
14. *Kaṇṭakārī*	40 Gms.
15. *Śṛṅgī*	40 Gms.
16. *Tāmalakī*	40 Gms.
17. *Drākṣā*	40 Gms.
18. *Jīvantī*	40 Gms.

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19. *Puṣkara*	40 Gms.
20. *Agaru*	40 Gms.
21. *Haritaki*	40 Gms.
22. *Ṛddhi*	40 Gms.
23. *Jīvaka*	40 Gms.
24. *Ṛṣabhaka*	40 Gms.
25. *Śaṭī*	40 Gms.
26. *Mūṣṭa*	40 Gms.
27. *Punarnavā*	40 Gms.
28. *Medā*	40 Gms.
29. *Elā*	40 Gms.
30. *Candana*	40 Gms.
31. *Utpala*	40 Gms.
32. *Vidārīkanda*	40 Gms.
33. *Vasa mūla*	40 Gms.
34. *Kakoli*	40 Gms.
35. *Kākanāsikā*	40 Gms.
36. *Āmalakī* (Wet)	500 No.
37. Water	12.288 Ltr.
38. *Ghṛta and Taila*	576 gm.
39. *Sarkara*	2.400 Kgs.

Prakṣepadravyas

41. *Madhu*	288 gms
42. *Vamsalocāna*	192 gms
43. *Pippalī Cūrṇa*	*96 gms*
44. *Twak Cūrṇa*	*48 gms*
44. *Elā*	*48 gms*
45. *Patra*	*48 gms*
47. *Nagakesara*	*48 gms*

Method of preparation

Ripened fresh *Āmalakis* are bundled in a piece of cloth. Ingredients from 1 to 36 are coarsely powdered and put in a vessel.Water (120 Lit.) is added and the *Āmalaki* bundle is immersed by suspension in the vessel and boiled till the water is reduced to one fourth (30 liters). The *Āmalaki* bundle is then removed and the decoction is strained and kept saperatly.

The seeds of the boiled *Āmalaki* are removed and the pulp is made in to a paste, which is then strained through a piece of cloth or sieve of 40 mesh over a wide-mouthed vessel. After the fibers are removed, the pulp is fried with *ghṛta* and *taila* (ingredients 38 & 39) till the moisture evaporates. Sugar is added to the decoction and boiled to *lehya pāka* at which stage the fried pulp is added and boiled

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again. Fine powders of ingredients 42 to 47 are added to the *lehya*, stirred well, and allowed to cool, at which stage *madhu* is added.

Dose : 12 to 24 gm

Anupāna : Milk

Therapeutic Uses : *Kāsa, Śwasa, Kṣatakṣīṇa, Swarabheda, Kṣaya, Hṛdroga* & Used as a *Rasāyana.*

Citrak Harītaki

चित्रकस्तामलक्याश्च गुडक्या दशमूलजम्। इतं पचे बनी भूते पलादशकं क्षिपेत्।।
व्योषखिजातयोः क्षारात् पलार्द्धमपरेऽहनि। प्रस्थादूर्ध्वं मधुनो दत्वा यथाग्न्यद्यायन्त्रणः।।

(भै.र. नासारोगाधिकार; ३१-३२, १/२)

Ingredients

1. *Citrakamul kwāth* - 4.8lit
2. *Bhūmyamalaki kwātha* - 4.8lit
3. *Gudūciśwaras kwātha* - 4.8lit
4. *Daśmūla kwātha* - 4.8lit
5. *Haritaki cūrṇa* - 3.072kg
6. *Guḍa* - 4.8kg
7. *Śuṇṭhi* - 96gm
8. *Mārica* - 96gm
9. *Pippali* - 96gm
10. *Twak* - 96gm
11. *Elā* - 96gm
12. *Pātra* - 96gm
13. *Yavākṣāra* - 24gm
14. *Madhu* - 384gm

Dose : 6-12gm

Anupāna : Water, milk

Therapeutic uses : *Gulma, Udavarta, Pinasa, Kāśa, Śwasa, Ārśa.*

Haridrā khaṇḍa

हरिद्रायाः पलान्यष्टौ षट्पलं हविषस्तथा। क्षीराढकेन संयुक्तं खण्डस्यार्द्धशतं तथा।।
पचेन्मृद्वग्निना वैद्यौ भाजने मृन्मये दृढे। कटुत्रिकं त्रिजातं चं कृमिघ्नं त्रिवृता तथा।।
त्रिफला केशरं मुस्तं लौहं प्रति पलं पलम्। सञ्चूर्ण्य प्रक्षिपेत्तत्र तोलकार्द्धन्तु परमौषधम्।।
कण्डूविस्फोटदद्रूणां नाशनं परमौषधम्। प्रतप्तकाञ्चनाभासो देहो भवति नान्यथा।।
शीतपित्तोदर्दकोठान् सप्ताहादेव नाशयेत्। हरिद्रा नामतः खण्डः कण्डूनां परमौषधम्।।

(भैष्ज्यरत्नावली-उदर्दशीतपित्रे)

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Ingredients

1.	*Haridra*	-	768gm	10.	*Patra*	-	96gm
2.	*Goghṛta*	-	572gm	11.	*Viḍanga*	-	96gm
3.	*Godugdha*	-	6.144lit	12.	*Trivṛt*	-	96gm
4.	*Khaṇḍa*	-	4.8kg	13.	*Haritaki*	-	96gm
5.	*Śuṇṭhi*	-	96gm	14.	*Vibhītaki*	-	96gm
6.	*Marica*	-	96gm	15.	*Āmalaki*	-	96gm
7.	*Pippali*	-	96gm	16.	*Nāgakeśar*	-	96gm
8.	*Twāk*	-	96gm	17.	*Mustha*	-	96gm
9.	*Elā*	-	96gm	18.	*Lohabhasma*	-	96gm

Procedure

Wet form of *haridra* is collected and cleaned well then external covering is separated with knife and it is made into *kalaka* form with the help of *khalva yantra* then this *kalka* is fried with *Go-Ghṛta* over *mṛduagni* till *ghṛta* get separated from *kalka,* then vessel mentioned quantity of sugar and appropriate quantity of water is taken and *pāka* is prepared, when *pāka lakṣnas* are obtained, then all ready prepared *ghṛta bharjita haridra kalka* is added and mixed uniformely. Vessel is taken out from the fire and *sūkṣma cūṇa* of No. 5 to 18 drugs are added and mixed uniformely and it is preserved in glass container. *Haridra* is the main drug in this recipe hence it is called *hardra khaṇḍa.*

Dose : 6 gm

Anupāna : Water, milk

Time of administration : Morning and evening

Therapeutic uses

Śītapitta, Kaṇḍu, Viśpoṭā; Dadru, Udardha, Khoṭa and Kṛmi roga.

Satavari Kalpā

शतावरी पठद्यते। वातपित्तहरी वृष्या स्वादुतिक्ता शतावरी। महती चैव हृद्या च मेध्याऽग्निबलबधिनी।।
ग्रहण्यशोंविकारघ्न शीता रसायनी। कफपित्तहरास्तिक्तास्तस्या एवाङ्कुरा: स्मृता:।। (सु.सू.अ. ४६)

Ingredients

1. *Satāvari* (Asparagus sativus) - 4kg
2. *Sugar* - 8kg

Method of preparation : Fine powder of *satāvari* is mixed in the syrup made with sugar and then granules are prepared.

Dose : 250-500 mg

Therapeutic uses

Strīrog, Vātarog, Balya, Vṛśya, Ātisāra.

Saubhāgya Śuṇṭhi

कशेरूश्रृंगाटवराटमुस्तं द्विजीरकं जातिफलं सकोषम्। लवंग शैलेयसनागपुष्पं पत्रां वरांगं शटिधातकी एला शताह्वा धनिकेभपिप्पली सपिप्पली सोशल्का शतावरी। प्रत्येक मेषामिह कशयुग्मं लौहं तथाभ्रम

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पलभागयुक्तम् ।। महोषधाच्चूर्णपलानि पलानि चाष्टौ त्रिशत्सितशर्करायाः। पलानि चाष्टावपि सर्पिषश्च प्रस्थद्वयं क्षीरमिहं प्रयुक्तम् ।। (भै.र. स्त्रीरोगाधिकार; ३९६-३९८)

Ingredients

1. *Kaśeru*	-	120gm	15. *Dhātaki*	-	120gm
2. *Sṛṅgatak*	-	120gm	16. *Elā*	-	120gm
3. *Kamalabija*	-	120gm	17. *Śatāhśwa*	-	120gm
4. *Musta*	-	120gm	18. *Dhānyaka*	-	120gm
5. *Swetajira*	-	120gm	19. *Gajapippali*	-	120gm
6. *Kṛṣnajira*	-	120gm	20. *Pippali*	-	120gm
7. *Jatiphāla*	-	120gm	21. *Marica*	-	120gm
8. *Jatikośa*	-	120gm	22. *Śatāvari*	-	120gm
9. *Lavaṇga*	-	120gm	23. *Loha bhasma*	-	240gm
10. *Saileya*	-	120gm	24. *Abhrakabhasma*	-	240gm
11. *Nagapuṣpa*	-	120gm	25. *Śuṇṭhi*	-	1.92kg
12. *Patra*	-	120gm	26. *Śarkara*	-	7.22kg
13. *Twāk*	-	120gm	27. *Ghṛta*	-	1.92kg
14. *Śaṭi*	-	120gm	28. *Godugdha*	-	7.68 lit

Dose : 12gm

Anupāna : Water,milk

Therapeutic uses

Agnimāṇdhya, Atisara, Grahaṇi, Sūtikaroga.

Vāsāvaleha

वासकस्वरसप्रस्थे सितामष्टपलोन्मिताम् । सर्पिशो द्विपलं दत्वा पिप्पलीद्विपलं तथा
पचेल्लेहत्वमायाते शीते मधु पलाष्टकम् । (भै.र. राजयक्ष्माधिकार; ८२-८३ १/२)

Appratus required : Avalehya pātra, Khalva yantra, cloth, stirrer.

Ingredients

1. *Vāsāśwaras*	-	1 Prastha
2. *Powdered Śita* (powdered sugracandy)	-	1 Mānika (8 pala's)
3. *Goghṛta*	-	2 palas
4. *Pipppali*	-	2 palas
5. *Madhu*	-	8 palas

Procedure

Vāsa swaras is extracted from freshly collected *vāsā leaves* and it is taken in to *avalehya pātra,* then powdered sugar candy, added and heated over *mandāgni,* when it reaches proper *pāka* state, *pippali cūrṇa* and *ghṛta* are added and mixed well, then *avalehya pātra* is taken out form the fire and when *avalehya pātra* is taken out from the fire and when *avalehya* becomes in to cold state *madhu* is mixed uniformly. This recipe is called *vāsāvalehya* and it is preserved in clean, air tight wide mouthed

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glass or plastic containers. (Some of the *vaidyas* advises that if fresh *vāsa swarasa* is not available *vāsa kwātha* prepared from *vāsa pañcāngas* also can be used.

Here is this formula, because *madhu* quantity is more, *pāka* should be made into more concentrated form, then *madhu* is to be mixed. By the name of *vāsāvalehya* quite different formula are explained in different *Āyurvedic classic.* Among those above mentioned formula is more popular and showing good results

Mātra : 4 *māṣa* to 8 *māṣa*

Anupāna : Luke worm milk, Sṛta śīta jala.

Therapeutic Uses

Rājayakṣma, Kāsa, Śwāsa, Pārśwa śūla, Hṛteūla, Jwara, Raktapitta,

Kūṣmāṇḍavalehya

निष्कुलीकृत्य कूष्माण्डखण्डात्पलशतं पचेत् ।। निक्षिप्य द्विगुणं नीरमर्धशिष्टं च गृह्यते ।
तानि कूष्माण्डखण्डानि पाडयेद्दृढवाससा ।। आतपे शोषयेत्किंञ्चिच्छूलाग्रैर्बहुशो व्यधेत् ।
क्षिप्त्वा ताम्रकटाहे च दद्यादष्टपलं घृतम् ।। तेन किञ्चिद् भर्जयित्वा पूर्वोक्तं तज्जलं क्षिपेत् ।
खण्डात्पलशतं दत्त्वा सर्वमेकत्र पाचयेत् ।। सुपक्वे पिप्पली शुण्ठी जीरकं द्विपलं पृथक् ।
पृथक्पलार्धं धान्याकं पत्रैला मरिचं त्वचम् ।। चूर्णीकृत्य क्षिपेत्तत्र घृतार्धं क्षौद्रमावपेत् ।
खादेदग्निबलं दृष्ट्वा रक्तपित्ती क्षयी ज्वरी ।। शोषतृष्णाभ्रमच्छर्दिश्वासकासक्षतातुरः ।
कूष्माण्डकावलेहोऽयं बालवृद्धेषु युज्यते ।। उरःसन्धानकृद् वृष्यो बृंहणो बलकृन्मतः ।

(शा.सं.मा.खा. ८.२२-२९)

Apparatus required

Avalehya pātra, Stirrer, Khalva yañtra, Tamra patra cloth etc.

Drugs required

Fine scrapings of *kuṣmāṇḍa* (devoid of outer skin and seeds)	:	100 pala (4,800 gms)
Water	:	200 pala (9,600 gms)
Goghṛta	:	8 pala (384 gms)
Sita (sugar candy)	:	100 pala (4,800 gms)
Pippalī	:	2 pala (96 gms)
Śuṇthi	:	2 pala (96 gms)
Jīraka	:	2 pala (96 gms)
Dhānyaka	:	$^1/_2$ pala (24 gms)
Patra	:	$^1/_2$ pala (24 gms)
Ela	:	$^1/_2$ pala (24 gms)
Marīca	:	$^1/_2$ pala (24 gms)
Twak	:	$^1/_2$ pala (24 gms)
Madhu	:	4 pala (192 gms)

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Procedure

Kūṣmāṇḍa phala is taken and it is devoided from it's outer skin and seeds. Then it is made into approximately two inch size pieces. These pieces are boiled in a vessel with water (two hundred *pala's*) till total quantity of water is reduced to half of the quantity. Then contents are filtered and this obtained *Kaṣāya* is kept ready in another vessel. Then *kūṣmāṇḍa* pieces are dried in sunlight for some time (by dispersing over a cloth). Then these well cooked pieces are pierced with numerous thick needles (to make it into a paste form), then fried in a copper vessel with eight *pala's* of ghee. The earlier *kaṣāya* is kept over fire in a *avalehyapātra,* and hundred *pala's* of *sita* (sugar candy) is added, when it attains *pāka,* then *kūṣmāṇḍa* is added and mixed well then cooked well till it gets *pāka siddha lakṣaṇa* then container is taken out from fire, and fine powder of *prakṣepadravyas* are added in following order, two *pala's* each of *pippalī, śuṇṭhi, jīraka,* and half *pala* each of *dhānyaka, patra, ela, marīca, twak* are added and mixed well. When contents becomes cooled, four *pala's* of *madhu* is added and mixed uniformely. Then it is preserved in clean well packed and wide mouthed glass or plastic containers. This recipe known as *Kūṣmāṇḍāvalehya* and is beneficial for both young and old age group.

Āmayika prayoga

Raktapitta, Kṣaya, Jwara, Śoṣa, Tṛṣṇa, Bhrama, Chardi, Swāsa, Kāsa, Urahkṣata.

Karma : *Vṛṣyam, Bhṛmhaṇam, Balya*

Mātra : 1 *tola*

Vyāghrī harītaki avalehya

समूलपुष्पच्छदकण्टकार्यास्तुलां जलद्रोणपरिप्लुताञ्च ।। हरीतकीनाञ्च शतं निदध्याद्विपच्य सम्यक्चरणावशेषम् ।
कटुत्रिकञ्च द्विपलप्रमाणं पलानि षट्पुष्परसस्य चात्र ।। क्षिपेच्चतुर्जातपलं यथाग्निं प्रयुज्यमानो विधिनाऽवलेहः ।
वातात्मकं पित्तकफोद्भवञ्च द्विदोषकासानपि च त्रिदोषम् ।। क्षयोद्भवञ्च क्षतजं च हन्यात् सपीनसश्वासस्वरक्षयं च ।
यक्ष्माणमेकादशमुग्ररूपं भृगूपदिष्टं हि रसायनं स्यात् । (भैषज्यरत्ना. कासे)

Apparatus

Avalehya pātra, Stirrer, Khalva yañtra, cloth, vessel etc.

Drugs

Kaṇṭakarī (Pañcānga's)	:	1 *Tula* (ser) (4 kg. 800 gms)
Harītakī	:	100 No.
Water	:	2 *Droṇa* (24 kg. 576 gms)
Purāṇa guḍa	:	100 *Pala* (4, 800 gms)

Prakṣepadravyas

Tikaṭu cūrṇa	:	6 pala's
Caturjāta cūrṇa	:	1 pala
Madhu	:	6 pala's

Procedure

Freshly collected *Pañcāngas* (after making them into small pieces) of *Kaṇṭakāri 1 tula* (4 kg. 800 gm) is taken in a vessel and 2 *Droṇa's* of water is added then ripened and well developed big size *Haritaki phala* 100 No.s are taken in a cloth and made in to *Poṭṭali* and with the help of stick hanged

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and immersed in water, which is present in the vessel along with *Pañcānga's* of *Kaṇṭakāri* (In the form of *Dola yañtra* apparatus is to be prepared). Then it is heated over *Mandāgni* till total water content is reduced up to 1/4th quantity, then vessel is taken out from the fire and *(Haritaki) Poṭṭali* is separated, then liquid content is filtered with cloth. This *Kwātha* is collected into *Avalehya pātra* and 100 *pala's* of *Purāṇa guḍa* in pieces form is added, then heated over *Mandāgni* to obtain *Pāka.* When contents are going to reach *Pāka (āsannapākāvasta), poṭṭali* is opened and *haritaki* is added to *pāka* and mixed uniformely, and heated till *pāka siddha lakṣaṇas* are produced, then *avalehya pātra* is taken out from fire and *prakṣepa dravya cūrṇa* (fine powder of *6 palas* of *trikaṭu cūrṇa* and 1 *pala* of *caturjātaka cūrṇa)* are added and mixed well. When contents becomes cool, *6 pala's* of *madhu* is added and mixed uniformely. It is preservced in clean, well packed and wide mouthed glass or plastic containers.This recipe is known as *Vyāghrī harītakī avalehya* and it is told by *Bhṛgumaharṣi.*

In this *avalehya, haritaki* will be present with seeds, hence while consuming, seeds are separated and only soft part only advised for consumption.

Some *Āyurvedic scholars* are preparing *Vyāghrī haritaki avalehya* with slight change like wise. 100 No. of *haritaki phal's* are taken and their seeds are removed, fine powder is prepared from *phala twak. Pāka* is prepared with *Kaṇṭakāri pādāvaseṣa kwātha* and *guḍa* as usual and when *pāka siddha lakṣanas* are appeared, *avalehya pātra* is taken out from fire and *haritaki sūkṣma cūrṇa* is added and mixed well, then rest of the *prakṣepa dravya cūrṇa* and *madhu* is mixed as usual.

Here 100 No. of *Haritaki* weight will be approximately 1170 gms.

This *Vyāghriharītakī avalehya* appears similar to the *Chyavanaprāśāvalehya,* but in taste it is *Kaṣāya rasa.*

Mātra : $^1/_2$ *tola* to 1 *tola*

Anupāna : *Sṛtaśītalajala, Mandoṣnadugdha*

Āmayika Prayoga

All varieties of *Kāsa,* including *Vātaja, Pittaja, Kaphaja, Dwidoṣaja Sannipātaja, Kṣayaja, Kṣataja Kāsa* and *Pīnasa, Swāsa, Swara bheda,* and severe *Rājayakṣma* having 11 varieties of complications.

Nārikela Khaṇḍa

नारेकेलपलान्यष्टौ शर्करा प्रस्थसम्मिता। तज्जलं पात्रमेकन्तु सर्पिः पञ्चपलानि च।।
शुण्ठीचूर्णस्य कुडवं प्रस्थार्द्धं क्षीरमेव च। सर्वमेकीकृतं पात्रे शनैर्मृद्वग्निना पचेत्।।
तुगा त्रिकटुकं मुस्तं चातुर्जातं सधान्यकम्। द्विकणाजीरकञ्चैव कर्षयुग्मं पृथक् पृथक्।।
श्लक्ष्णचूर्णं विनिक्षिप्य स्थापयेद् भाजने मृदः। खादेत्प्रतिदिनं शाणं यथेष्टाहारवानपि।।
सर्वदोषभवं शूलमेकजं द्वन्द्वजं तथा। परिणामभवं शूलमम्लपित्तं च नाशयेत्।।
बलपुष्टिकरं हृद्यं वाजीकरणमुत्तमम्। रक्तपित्तहरं श्रेष्ठं छर्दिहृद्रोगनाशनम्।।
धन्वन्तरिकृतं चैतन्नारिकेलरसायनम्।। (भै. रत्नावली-शूले)

Apparatus required

Two vessels, stirrer, *khalva yañtra,* cloth, knife.

Drugs Required

1. Coconut pulp (water containing coconut to be taken : 8 *Pala*

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2. Coconut water	:	Obtained quantity from above coconut
3. Sugar	:	1 *Prastha*
4. *Go-ghṛtha*	:	5 *Pala*
5. *Śuṇṭhī cūrṇa*	:	1 *Kuḍava*
6. Cows milk		
7. *Vamśa locana*	:	2 *Karṣa*
8. *Śuṇṭhi*	:	2 *Karṣa*
9. *Pipali*	:	2 *Karṣa*
10. *Marīca*	:	2 *Karṣa*
11. *Musta*	:	2 *Karṣa*
12. *Sūkṣma ela*	:	2 *Karṣa*
13. *Dālcini twak*	:	2 *Karṣa*
14. *Teja patra*	:	2 *Karṣa*
15. *Nāga keśara*	:	2 *Karṣa*
16. *Dhānyaka*	:	2 *Karṣa*
17. *Pippali*	:	2 *Karṣa*
18. *Gaja pippali*	:	2 *Karṣa*
19. *Jīraka*	:	2 *Karṣa*

No. 7 to 19 all the drugs should be made into *Sūkṣma cūrṇa* and kept ready.

Procedure

Coconut pulp is made into very minute small particles then it is taken into a vessel and cooked in milk till contents becomes into concentrated from (like cova), then *ghṛta* is added and fried then vessel is taken out from the fire and kept ready. In another vessel mentioned quantity of sugar and coconut water should be heated over *madyamāgni* till *pāka lakṣnas* are obtained, then all ready prepared cova like material is added and mixed well, hen vessel is taken out from fire and fine powder of No.7 to 19 drugs are added and mixed uniformly and mixing is continued till the contents becomes into *Śwāngaśīthala* and final product will be produced in the form of coares powder then it is preserved in glass containers. Coconut is the main drug in this recipe hence it is called *Nārikela khaṇda.*

Mātra : 1 *Ṣāṇa*

Anupāna : Water, cows milk

Time of administration : Morning, afternoon an evening

Āmayika prayoga

Karmabalya, Rasāyana, Vājīkaraṇa. All varieties of *udarasūla, pariṇāma śūla, āmlapitta, vamana, rakta pitta, hṛdroga.*

Soubhāgyaśuṇṭhī pāka

त्रिकटुत्रिफलाजाजीचातुर्जातकमुस्तकम् । जातीकोषफलं धान्यं लवङ्गं शतपुष्पिका ।।
नलिका मदनफलं यमानीद्वयधातकी । शतावरी तालमूली लोध्रं वारणपिप्पली ।।
प्रियालबीजममृता कर्पूरं चन्दनद्वयम् । कर्षप्रमाणान्येतेषां श्लक्ष्णचूर्णानि कारयेत् ।।
नागरस्य च चूर्णस्य प्रस्थद्वयमितं क्षिपेत् । दृढे च मृन्मये पात्रे पाचयेन्मृदुनाऽग्निना ।।

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यत्नतः पाकविद्वैद्यो गुटिकां कारयेत्ततः। घृतमष्टपलं दद्यात् क्षीरप्रस्थद्वयं तथा।।
सार्धप्रस्थद्वयं चात्र शर्करायास्ततः क्षिपेत्। भक्षयेत् प्रातरुत्थाय अजाक्षीरं पिबेदनु।।
आमवातं निहन्त्याशु कासं श्वासं सपीनसम्। ग्रहणीमम्लपित्तं च रक्तपित्तं क्षतक्षयम्।।
स्त्रीरोगान् विंशतिं चैव तत्क्षणादेव नाशयेत्। अहन्यहनि च स्त्रीणां स्तनदार्ढ्यकरं परम्।।
सौभाग्यजननं स्त्रीणां पुष्टिदं धातुवर्धनम्। (भै.र. सूतिका)

Apparatus required

Two vessels, Stirrer, *Khalva yañtra,* cloth etc.

Drugs Required

1. *Suṇṭhī*	:	1 *Karṣa* (12 gms)
2. *Pippali*	:	1 *Karṣa* (12 gms)
3. *Marīca*	:	1 *Karṣa* (12 gms)
4. *Harītaki*	:	1 *Karṣa* (12 gms)
5. *Āmalaki*	:	1 *Karṣa* (12 gms)
6. *Vibhītaki*	:	1 *Karṣa* (12 gms)
7. *Jīraka*	:	1 *Karṣa* (12 gms)
8. *Dālcīnī twak*	:	1 *Karṣa* (12 gms)
9. *Tejapatra*	:	1 *Karṣa* (12 gms)
10. *Sūkṣma ela*	:	1 *Karṣa* (12 gms)
11. *Nāgakeśara*	:	1 *Karṣa* (12 gms)
12. *Musta*	:	1 *Karṣa* (12 gms)
13. *Jāpatri*	:	1 *Karṣa* (12 gms)
14. *Jāyaphala*	:	1 *Karṣa* (12 gms)
15. *Dhānyaka*	:	1 *Karṣa* (12 gms)
16. *Lavanga*	:	1 *Karṣa* (12 gms)
17. *Śatapuṣpa*	:	1 *Karṣa* (12 gms)
18. *Nalika*	:	1 *Karṣa* (12 gms)
19. *Madanaphala*	:	1 *Karṣa* (12 gms)
20. *Ajavāyin*	:	1 *Karṣa* (12 gms)
21. *Ajamoda*	:	1 *Karṣa* (12 gms)
22. *Dhātakī puṣpa*	:	1 *Karṣa* (12 gms)
23. *Śatāvarī*	:	1 *Karṣa* (12 gms)
24. *Śyāma musalī*	:	1 *Karṣa* (12 gms)
25. *Lodhra*	:	1 *Karṣa* (12 gms)
26. *Gaja pippali*	:	1 *Karṣa* (12 gms)
27. *Priyāla bīja*	:	1 *Karṣa* (12 gms)
28. *Gḍūci*	:	1 *Karṣa* (12 gms)
29. *Karpūra*	:	1 *Karṣa* (12 gms)
30. *Rakta candana*	:	1 *Karṣa* (12 gms)

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31. *Sweta candana*	:	1 *Karṣa* (12 gms)
32. *Śuṇṭthi cūrṇa*	:	2 *Prasthas* (1536 gms)
33. *Go-Ghṛta*	:	8 *Palas* (384 gms)
34. *Sugar*	:	2 *Prasthas* (1536 gms)
35. Cows milk	:	2 *Prasthas*

No. 1 to No. 31 all drugs are taken in equal quantity and prepared into *Sūkṣma cūrṇa* form. *Suṇṭhi* also prepared into *Sūkṣma cūrṇa* form separately.

Procedure

Milk is taken in a vessel and heated with *Madyamāgni,* when milk is get boiled well, *śuṇṭhi cūrṇa* is added and mixed with stirrer continuously till he contents becomes into soft material (like cova), then *Go-ghṛta* is added and contents are made *bharjana* then vessel is taken out from the fire and kept ready. In another vessel mentioned quantity of sugar is taken and mixed with appropriate quantity of water then *pāka* is prepared over *mandāgni,* when *pāka lakṣnās* are obtained, the first prepared (cova like) material is added and mixed well, after that vessel is taken out from fire and *Sūkṣma cūrṇa* of above mentioned drugs No. 1 to 31 are added and mixed uniformly. This material is moulded into *guṭikā* form and preserved in glass containers. This recipe is called *Soubhāgya śuṇṭhī pāka.*

Karma : *Puṣṭikaram, dhātuvardhanam, stanya vardhakam, strīstanapuṣṭikaram.*

Mātra : 1 tola (12 gms)

Anupāna : Warm milk of goat

Āmayika Prayoga

This is a best recipe for inproving lactation. It is most useful recipe for the administration of post-delivery womens. For *Sūtīkā-roga* treatment 1 *Guṭikā* twice in a day is advised along with warm goatmilk. It is also useful for *Āmavāta, kāsa, śwāsa, Pīnasa, Grahaṇī, Āmlapitta, Raktapitta, Kṣatakṣaya, Rājayakṣma,* twenty varieties of *Strīroga. Śuṇṭhī* is main drug in this recipe and its administration after delivary is considered as *Soubhāgya* for women hence this recipe is called *Soubhāgya śuṇṭhī pāka.*

Muśalī pāka

सुतालमूलीद्वयचूर्णमेव सुवस्त्रपूतं विनिगृह्य प्रस्थम् । गोदुग्धप्रस्थैर्वसुभिश्च पाच्यं यावद्घनं तत्प्रसमीक्ष्य सर्वम् ।।
पलाष्टकेनाथ घृतेन भृष्ट्वा पलैकमानानितथौषधानि । संवक्ष्यमानानि गुरुक्तयुक्त्या खण्डं द्विमानं सकलौषधीभ्यः ।।
गोकण्टकं चेक्षुशतावरीभ्यां शिवाकणावानरीबीजपत्रैः । लवङ्गखर्जूरसुजातिपत्री मज्जात्रयैश्चन्दनगोस्तनीभ्याम् ।।
जातीफलैलानतवङ्गयुक्तं ग्राह्यं तथोक्तं सकलं पलैकम् । पलद्वयं मोदकमस्य प्रातः सायं समश्नाति समाक्षिकाज्यम् ।।
वृद्धोऽपि तारुण्ययुतस्तरुण्या युक्तोऽपि चान्यास्तरुणी रिरंसुः । वीर्यप्रमोदैर्बलपौरुषाभ्यां युक्तः सुद्योगगणैर्विमुक्तः ।।

(भा.भै.र. ४. पृष्ठ २३६)

Apparatus Required

Two vessels, stirrer, *Khalva yañtra*, cloth etc.

Drugs Required

1. *Śweta muśalī*	:	1/2 *Prastha*
2. *Śyāma muśalī*	:	1/2 *Prastha* (1 *Prastha*-768 gms)
		Sūkṣma Cūrṇa

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3.	Cows milk	:	1 *Prastha*
4.	*Ghṛta*	:	8 *Pala*
5.	*Sugar*	:	Two times to quantity of all the ingredient
6.	*Gokṣūra*	:	1 *Pala*
7.	*Tālamkhāna*	:	1 *Pala*
8.	*Śatāvari*	:	1 *Pala*
9.	*Harītaki* (big size)	:	1 *Pala*
10.	*Pippali* (big size)	:	1 *Pala*
11.	*Kavācabīja*	:	1 *Pala*
12.	*Tejapatra*	:	1 *Pala*
13.	*Lavanga*	:	1 *Pala*
14.	*Piṇḍa Kharjūra*	:	1 *Pala*
15.	*Jāpatrī*	:	1 *Pala*
16.	*Nārikelamajja*	:	1 *Pala*
17.	*Bādam majja*	:	1 *Pala*
18.	*Cirounjī bīja*	:	1 *Pala*
19.	*Śweta Candana*	:	1 *Pala*
20.	*Drākṣa*	:	1 *Pala*
21.	*Jāyaphala*	:	1 *Pala*
22.	*Sūkṣma ela*	:	1 *Pala*
23.	*Tagara*	:	1 *Pala*
24.	*Vangbhasma*	:	1 *Pala*
25.	Water-Appropriate quantity		

Procedure

Two varieties of *Muśalī* separately made into fine powder form, then No. 6 to No. 24 all drugs are made into fine powder form. First of all *Sūkṣma cūrṇa* of two varieties of *Mūśalī* is mixed in cows milk (in an vessel) and heated over *Madyamāgni.* When milk becomes into concentrated *Pāka* (Kova like), *Go-ghṛta* is added and fried the contents, then vessel is taken out from fire. In another vessel sugar and appropriate quantity of water is taken and *Pāka* is prepared over *Mandāgni.* When *Pāka lakṣṇas* are attained, already prepared *Kova* like substance (mixture of milk, two varieties of *muśalī cūrṇa* and *ghṛta*) is added and mixed uniformly, then vessel is taken out from fire and added the fine powder of above mentioned drugs No.6 to No.24 and mixed uniformely. Then contents are rolled into *Vaṭakā* form equal to the size of 1 *tola* and preserved in glass container.

As *Muśali* is main drug, hence this recipe is called *Muśalī pāka.*

Mātra : 2 *Tola* (2 *Vaṭaka*)

Anupāna : *Go-ghṛta*

After consuming, a drink of warm milk is advised.

Time of administration : Morning and evening

Karma : Best *Vajī karaṇa, Bala vīrya, Pouruṣa, Vriddikaram*

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Āmayika Prayoga

Netraroga.

Ghana Sattva

Synonyms

Ghaṇa Sattwa, Sattva, Sāra

E.g. *Guḍūci sattva , udhumbara sāra, ārdraka sattva* etc.

Sattva is water extractable solid substance(potential portion) of a drug. *Sattva* are sedimented extracts of drugs which are predominantly starchy in nature. The most common type of *sattva* is the *Guḍūci* sattva which is the starch of tinospora.

Apparaturs Required

1. Two large wide mouthed vessels.
2. A very fine sieve

Drugs Required

1. The drug from which the starch is to be prepared appropriate quantity.
2. Water- appropriate quantity.

Procedure

The method of extraction of *sattva* differs from drug to drug and can be refered at appropriate places. The common preparation method of *sattva kalpanā* is mentioned like- wise.

The drug is cut into small pieces soaked in water and kept over night. Next morning the contents are churned or repeatedly squeezed and washed in the water without changing the water when the drug has lost all its mucilagenous properties by washing, the fibrous material and other coarse material are removed. Then the water is kept undisturbed overnight to allow the particles of starch to settle down. The next day morning the supernatant liquid is decanted carefulluy without disturbing sedimented starch.

The starch is washed in little amount of water and recovered by settling down. The *sattva* so sedimented is allowed to dry and powdered.

The colour is white or pale white depending on the drug but the colour usually varies from drug to drug.

Preservation

The wet starch is dried completely and packed in damp proof packets of polythene or tubes of glass or plastic. They should not be exposed to heat or cold. They are to be stored in air tight containers.

Expriry date

This can be preserved indefinitely.

Amrutha sattva

Apparatus Required

Vessel, cloth

Drugs Required

Wet *Guḍūci, kāṇḍa*-1 part. Water – 4 parts

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Procedure

Fresh *Guḍūci, kāṇḍa* is collected and cleaned with water,then dried and made into small pieces then collected into *khalwa yantra* and crushed once again made into small pieces, then these pieces are collected into a big vessel and added 4 times of water then kept for over night . Next morning *Guḍūci* pieces are rubbed with hands in little water for many times. Then nice foam (*Phena*) will be generated. That indicates active ingredients get dissolved. Properly properties in the water in the form of starch, then *guḍūci, kāṇḍa* pieces are separated and contents in the vessel are kept for some time to settle down. Then these contents are filtered with cloth into another vessel and it is kept for 12 hours as it is to settle down the contents in the water. During this period *guḍūciattva* gets separated from water and settles at the bottom of the container. Then supernatent water is decanted carefully without disturbing sedimented starch. The starch is washed in a little amount of water and recovered by settling down. The *sattva* so sedimented is allowed to dry and powdered.

Preservation

The wet starch is dried completely and packed in damp proof packets of polythene or tubes of glass or plastic. They should not be exposed to heat or cold, they are to be stored in air tight continers.

Characters

Colour	:	*HarithābhaŚweta*
Guṇa	:	*Mṛdhu, Slakṣana*
Rasa	:	*Tikta*
Mātra	:	*250 – 500 mg.*
Anupāna	:	*Madhu, water.*
Kārma	:	*Pitta Śamaka, Jwaraghṇa, Balya, Vṛṣya Śukrala.*

Āmayika Prayoga

Jwara, Rakta Pitta, Dāha, Mūrcha, Apasmāra, Kaṇḍu, Kuṣṭa, Mūtra Pradāha, Mūtra Kṛchra, Prameha, Aruchi, Tṛṣṇa, Śwāsa, Pānḍu, Arśo, Hikka.

Adulteration

At present in market, some times adulterated *guḍūci sattva* also sold which is prepared by arowroot powder mixed with *guḍūci swarasa* and dried in sunlight , this will have the characters all most all similar to the *guḍūci sattva*.

Udumbara Ghanasāra

Apparatus Required

Vessel, earthen pot, cloth, khalvayantra.

Drugs Required

Udumbara mūla twak- 1 part , water- 4 parts.

Procedure

Udumbara mūla twak is cleaned and dried well then it is made into *yavakūṭa cūrṇa* and collected into a vessel. Then added the four times of water and kept overnight. Next day morning contents are heated till total quantity of contents are reduced up to 1/4th quantity. These contents are filtered with

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cloth for 2 to 3 times, again this filtered kwatha should be boiled slowly, when the water gets evaporated and contents will get the consistency equal to *madhu*, then after equal to the *avalehya* consistency, at this stage vessel is taken out from fire, contents are collected into tray and dispersed uniformly and dried in sunlight for 15 days. So obtained product is caled *udumbara ghana sāra* and it is preserved in glass container.

Āmayika Prayoga

Dāha, Raktasrāva, Pitta Prakopa, Raktapitta, Pravāhika, Kuṣṭa, Tṛṣna, Jwara, arśoroga, bhagandara, Vraṇa.

Administration

While administration it has to be mixed in water.

Anupāna: Water, milk.

Cūrṇa Kalpanā

Cūrṇa is that macerated without any liquid.

Cūrṇa is fine dry powder or a drug or drugs. The term *cūrṇa* may be applied to the powder of a single drug or a mixture of two or more drugs which are powdered separately prior to their being mixed to homogeneity.

अत्यन्तशुष्कं यद्द्रव्यं सुपिष्टं वस्त्रगालितम् । तत्स्याच्चूर्णे रजः क्षोदस्तन्मात्रा कर्षसंमिता ।।

(शा. सं. म. ख. ६.१)

According to author *Śāraṅghadhara, cūrṇa* means , nicely powdered dry drug which is filtered through a cloth. *Rajaha* or *kṣoda* (pulvis, powder) are the synonyms explained for *cūrṇa*, it is supposed to be administered in the dose of one *Karṣa Pramāṇa*.

चूर्णो गुडः समो देयः शर्करा द्विगुणा भवेत् । चूर्णेषु भर्जितं हिङ्गु देयं नोत्क्लेदकृद्भवेत् ।।
लिहेच्चूर्णे द्रवैः सर्वैर्घृताद्यैर्द्विगुणोन्मितैः । पिबेच्चतुर्गुणैरेव चूर्णमालोडितं द्रवैः ।।

(शा. सं. म. ख. ६.२-३)

Jaggery if to be added to this powder, should be equal in quantity, sugar double in quantity and fried *hungu* only that much which shall not cause nausea (required amount) . *Cūrṇas* are usually administered with equal quantities of ghee, honey or *tailas* (vehicles). If they are be taken with decoction, water or milk etc., such liquid should be four times to that *cūrṇa* quantity.

Ācārya Kāśyapa has mentioned *cūrṇa* uses as mentioned below:

सूक्ष्मचूर्णीकृतं चूर्णं नानाकर्मसु युज्यते । ग्रहण्यामविकारेषु व्रणवर्त्यञ्जनादिषु ।।

(का. सं. खिलस्थानम् ३.३६)

The substance which is made in to fine powdered form is called *cūrṇa*. This *cūrṇa* is used for *grahaṇi roga, āma vikāra, vraṇa* and for the purpose of *anjana* etc.

Similarities of cūrṇa and kalka kalpanā

शुष्कपिष्टः सूक्ष्मतान्तवपटच्युतश्चूर्णः । तस्य समस्तद्रव्यापरित्यागादाप्लुतोपयोगाच्च कल्कादभेदः ।।

(अ. सं. क. ८.१०)

Cūrṇa is considered as modified form of *kalka kalpana*. Because dried form of *kalka* can be con-

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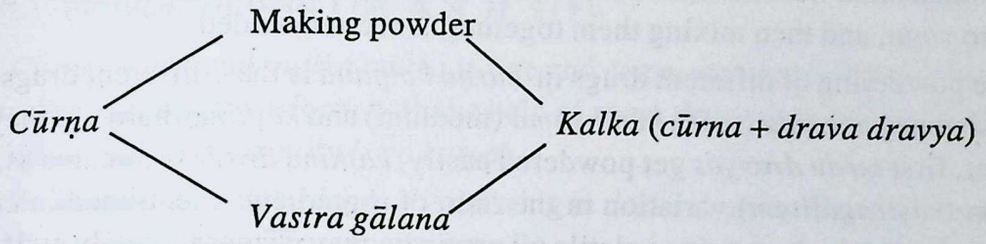
sidered as curna and many of the times *cūrṇa* is used to make the kalka. *Cūrṇa* is not different from *kalka*, because it is not devoid of any part of the drug and used well soaked in fluids.

Pharmaceutical process of *kalka* and *cūrṇa* having many similar features. In certain conditions, *kalka* can be prepared with *suṣka dravyas* (dried drugs) by making them *vastrea gālita cūrṇa* and adding *drava dravya*.

The process of pounding and *vastra gālana* is similar for both *cūrṇa* and *kalka*. Only for making *kalka, drava dravya* has to be added after *vastra gālana*.



While administration of *cūrṇa* , it can be mixed with *anupāna dravya*, then converted in to *kalka* (paste) like consistency, then consumed.

Preparation

Fine powder is prepared easily with some of the drugs, those which are having more starch in their composition. E.g. *ativisa*, *sringāṭaka*, etc.

Mode of administration

चूर्णे गुडः समो देयः शर्करा द्विगुणा भवेत् । चूर्णर्षषु भर्जितं हिंगु देयं नोत्क्लेदकृद् भवेत् ।। (शां. म. ६/२)

Usually wherever the *anupāna* is *ghṛta*, *madhu* and milk etc. the drug should be first mixed with thosed *anupanas*, thereafter it is to be taken.

Bhāvanadravya mātra related with cūrṇa

द्रवेण यावता सम्यक चूर्ण सर्वं प्लुतं भवेत् । भावनायाः प्रमाणां तु चूर्णे प्रोक्तं भिषग्वरैः ।। (शा. म. अ. ६/६)

The quantity of any liquid which soaks the powder fully well is called *bhāvanadravya*.

Preparation

Equipment required

1. The drugs enumerated in the recipe in clean and well dried state.
2. A mortar and pestle.
3. A fine sieve or fine cloth.

In the large scale manufacture in pharmacies, distintegrators, pulvarisers, and ball mills etc. are employed for powdering. The sieving is done by mechanical shifters which handle large quantities of material in a short time.

Process of Preparation

The drugs which are to be used in the prepartion should be taken from recently collected material. Drugs which are aged by prolonged storage or changed in colour, taste , smell and those which are insect infested should be positively rejected. However, drugs like embelia, fruits, long pepper, coriander seeds, honey, jaggery, and even cow's ghee are preferred from old stock, which should be unspoilt otherwise.

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In general, the aromatic are slightly fried in order to increase or sweeten their aroma. Any extraneous material should be removed from the drugs.

The drugs mentioned in the *cūrṇa yoga* are cleaned and dried. They are powdered by pounding in with mortar and pestle and sieved through a thin layer of cloth (*Vastragalita*). In a prescription where are a number of ingredients are present, the best method is to powder the drugs separately, weigh the required quantities of the drugs and mix them all together.

As some of the drugs contian more fibrous matter than others, this method of powdering and weighing them separately according to *yoga*, and then mixing them together, is recommended.

The reason for separate powdering of different drugs in *cūrṇa kalpanā* is that, different drugs will have different types of consistency as *mṛdu* (soft), *madhyama* (medium) and *kaṭhina* (hard). If they are mixed and pounded together, first *mṛdu dravyas* get powdered easily, *kaṭhina dravyas* remains as it is, hence while doing filtration (*vastragālitam*) variation in the ratio of ingredients mentioned in *cūrṇa formulae* take place and also drugs which contains volatile oil property, may evaporate easily and burnt sometimes, before *kaṭhina dravyas* get powdered uniformly.

So that, it is advised to powder all drugs of *cūrṇa* formulae separately, then only they are supposed to be mixed together uniformly to get better therapeutic results from the administered *cūrṇa formulae*.

Swādiṣṭa virecana *cūrṇa*, *lavaṇa bhāskara cūrṇa*, *hingvaṣṭaka cūrṇa* etc., which are having combination of sugar, salt as a ingredient should not be formulated during rainy season, because they may get spoiled with in a short period by attracting moisture from atmospheric conditions, it happens because of more hygroscopic nature of ingredients in the recipe.

A volatile principle may get volatalized during the milling process. This is due to the more exposed surface area of the crude drug and also to the increase in temperature during grinding. Therefore, drugs like clove, cardamom, caraway or cinnamon are not powdered to a very fine form.

Preserving of a powdered drug may create a problem. This is so because the large surface area of the powder is exposed to the atmosphere. Oxidation of the active constituent by atmospheric oxygen or volatalization, may occur. Hence, powdered drugs are stored in well closed containers in cool places.

In industry, however, all the drugs are cleaned, dried and powdered , together by disintegrators. Mechanical sifters could also be used. The finer the powder, the better its therapeutic effectiveness.

When *hingu, saindhava lavaṇa* and similar drugs are to be added they are fried well and powdered so that they do not become moist. Sugar and camphor are powdered separately and added.

Cūrṇa is often taken with some *anūpana* or vehicle such as milk, butter milk, ghee, honey etc., depending upon the formulation and indication. Ghee and honey are added twice the quantity of the powder.

The *Cūrṇa* should be very fine, amorphous and should be perfectly dry. The fineness of the sieve used should be preferably 80 mesh per square inch or still finer. More fine the powder, better is the therapeutic value.

Preservation

Cūrṇa should be packed in air tight containers. Usually the prepared *cūrṇa* should be stored in tightly stoppered glass bottles, Polythene and foil packing also gives damp proof protection.

It is said that the *cūrṇa* retain their potency for two months and then gradually deteriorate. In any case, unless otherwise spoilt by moisture or fungi, the *cūrṇa* keep active for an year.

In these days, for easy handling in a convenient from the *cūrṇa* and pressed into tablets of uniform

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weight and packed in bottles or tubes made of glass or plastic.

They should kept in air tight containers. And generally used within two months.

Cūrṇa which are made with combination of *kṣāra* should not be preserved in *lauha pātra* (iron container).

Matra

तन्मात्रा कर्षसंमिता । (शै. सं. म. ख. ६/१)

तन्मात्रा कोलसम्मितम् । (शै. सं. म. ख. ६/१)

Curṇa, *kalka* and *guṭika mātra* is one and same, that is one *karṣa pramāṇa*. If curna is advised to chew after making paste form with the help of some *drava dravya*, then that *drava dravya* is advised to take in to two times quantity (*two karsa*).

If *cūrṇa* is advised to drink after mixing in *drava dravya*, than the *drava dravya* quantity should be four times (*four karṣa*) more than *cūrṇa*.

Modern Aspect of Cūrṇa (Powders)

Powders are the solid dosage form of medicament which are meant for internal and external use. They are available in crystalline or amorphous form. Though the drugs are prepared in many different physical forms and shapes but many of them are prepared by using powders in one way or the other.

Advantages of Powders

1. Most of the drugs are available in powder forms and it becomes more convenient for the physician to prescribe specific amount of medicament according to the need of the patient.
2. The smaller particle size of powders produces more rapid dissolution in the body fluids than other solid dosage forms of medicament e.g. tablets, capsules, pills. The rapid dissolution increases the blood concentration in a shorter time , there by the action is produced in a lesser time.
3. Large quantities of bulky drugs which are otherwise difficult to administer like, *Āyurvedic drugs* can be easily administered by mixing with liquids or *Anupāna*.
4. They are more economical as compared to other dosage forms because for extemporaneous preparation they do not require any special technique or machinery.
5. Children and old persons who cannot swallow solid dosage forms can easily ingest powders which can be dispered in water or any other liquid and may be administered through feeding tube to the patients who are fed by tubes which terminate in the stomach itself.

Disadvantages

1. Drugs which deteriorate on exposure to atmospheric conditions are not suitable for dispensing in powder forms.
2. Bitter, nauseous, corrosive and unpalatable drugs cannot be dispensed in powder form.
3. Deliquescent and hygroscopic drugs cannot be dispensed in powder form.
4. Volatile drugs are not suitable for dispensing in powder form.

Classification of powders

Basically the powders are classified into two categories depending upon their mode of administration, they are :

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The powders meant for external application Eg. Dusting powders, insufflations and tooth powders etc.

The powders meant for internal administration, they are again sub- classified into two categories.

Simple powders

These powders contains only one ingredient either in crystalline or amorphous form.

Compound powders

These powders contains two or more than two substances which are mixed together and then divided into individual doses.

Separation of particles, according to their size, is known as size separation or sifting.

Sifting is also necessary, when the crude drug of animal or plant origin is to be comminuted. Soft portions of such crude drugs undergo fine particle size reduction , quickly, However, the coarse, hard material takes a longer time for grinding. In such a case a fine powder of the soft material unnecessarily remains in the mill . Hence, sifting is carried out by using sieves and the fine powder is removed. The coarse material left behind is again fed to the mill to be ground. Such a coarse powder is called as tailing or gruffs. This process is continued till all the material is reduced to the desired size. Finally all such fractions are mixed thoroughly to obtain a homogeneous mixture. So while milling, sifting is also carried out simultaneously.

There are different methods for size separation of a powder. These are classified as:

1. Sieving or screening. 2 Sedimentation or Elutriation, 3. Cyclone separation, 4. Air separation 5. Centrifugal classification.

However, during milling , sieves or screens are used for sifting.

Sieving or screening

This method is commonly employed for particle size separation, after comminution. Sieves are usually prepared using a metal or a plastic frame , and a wire or a fabric mesh. Powder passed through it is commonly designated by a number. It indicates the number of meshes (openings) in the length of 2.54 cm or one inch. Thus a number 10 sieve has 10 meshes (openings) per inch or 2.54 cm and not 10 wires, which would give 9 meshes (openings). The mesh size is also dependent on the thickness of the wire or the fabric used. Therefore, for standard sieves, wire gauge (thickness) is always specified. Indian Pharmacopoeia (I.P.) does not specify the material of construction of wire, but it mentions the gauge, to be used. Commonly used materials are iron, copper, stainless steel, hair, silk, nylon and terylene.

The following terms are commonly used with respect to powders.

Coarse powder (10/24)

All the particles of this powder pass through sieve no. 44, and not more than 40 percent pass through sieve No. 44.

Moderately coarse powder (22/60)

All the particles of this powder pass through sieve no.44, and not more than 40 percent pass through sieve no.85.

Moderately fine powder (44/85)

All the particles of this powder pass through sieve no. 44, and not more than 40 percent pass through sieve no. 85.

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Fine powder (85)

All the particles of this powder pass through sieve no. 85.

Very fine powder (120)

All the particles of this powder pass through sieve no.120. When the particles are described as above, the terms are relative such as coarse powder, moderately coarse powder or fine powder. Accordingly, the size ranges may be given as :

Sieve range

All the particles above 50 micron diameter come under sieve range.There is no higher limit. However, in the pharmaceutical industry, normally as drugs are used in powder form, I.P. gives a limit for coarse powder of 1676 micron diameter.

Sub- sieve range

This extends from 1 to 50 micron diameter particles.

Sub- micron range

Particles of size below one micron diameter.

Note : One micron is 1/1000 part of millimeter.

As mentioned earlier, the sieves are made of wire or of fabrics of uniform cross section (thickness or gauge) . I.P. specifications for wire and aperture size are given below:

No. of sieve	*Nominal size of aperture in mm*	*Nominal diameter of wire in mm*	*Standard wire gauge*	*Aprox screening area percent*	*Aperture tolerance average percent*
6	3.812	1.422	17.0	44	3.2
8	2.057	1.118	18.5	42	3.3
10	1.676	0.864	20.5	44	3.3
22	0.699	0.457	26.0	36	4.0
25	0.599	0.417	27.0	35	4.2
30	0.500	0.345	29.0	35	4.4
36	0.422	0.284	31.5	36	4.9
44	0.353	0.224	34.5	38	4.8
60	0.251	0.173	37.0	35	5.3
85	0.178	0.122	40.0	35	5.9
100	0.152	0.102	42.0	35	6.2
200	0.076	0.051	47.0	36	8.2

Size separation by a sieve may be effected using sieves either by manual operation or by mechanical means.

The above mentioned internal administration powders can be enclosed in

Āmalaki Rasāyan

धात्रीचूर्णस्य कंसं स्वरसपरिगतं क्षौद्रसर्पिः समांशं कृष्णामानीसिताऽष्टप्रसृतयुतमिदं रक्षितं भस्मराशौ वर्षान्ते तत्समश्नन् भवति विपलितो रूपवर्णप्रतापै र्निर्याधिर्बुद्धिमेधास्मृति वचनबलस्थर्यसत्वैरूपेतः ।।

(भै. र. रसायन प्रकरण / २५)

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Ingredients

1. *Āmalki Cūrṇa*	3.72 kg
2. *Āmla Śwarāsa*	Q.S.
3. *Honey*	3.72 kg
4. *Ghṛta*	3.72 kg
5. *Pippali Chūrṇa*	0.384 kg
6. *Śīta*/ खांड	0.768 kg

Method of Preparation

Fine powder of *āmalki cūrṇa* is triturated with adding *āmalaki śwarāsa* in appropriate quantity for 21 times then mentioned quantity of *Madhu*, *Ghṛta pippali Cūrṇa* and *Śīta* area mixed together an eartheni pot in rainy season. This earthen pot should be kept in a pit made in the earth dusigy Saraed season it will be taken out and it is administered.

Theraeutic Uses

Bāla, Vārṇa, Buddi, Medo, Smrūti, Pradīptikāra, Stṛnarogāhar, Pittajavyādhihar.

Āmalaki Cūrṇa

विद्यादामलके सर्वान् रसान् लवणवर्जितान् । (च. सू. २७/१४७)
ऋम्लं समधुरं तिक्तं कषायं कटुकं सरम् । चक्षुष्यं सर्वदोषाघ्नं वृष्यमामलकी फलम् ।।
हन्ति वातं तदम्लवत्पित्तं माधूर्यशैत्यतः । कफं रूक्षकषायत्वात्फलेभ्योऽभ्यधिक च तत् ।।
(सु. सू. ४६/१४३-१४४)

Ingredients

1. *Āmalaki fruit pulp* 500 gm

Dose : 3-6gm

Therapeutic Uses

Raktapitta, Āmlapitta, Meha, Dāha.

Avipattikara Cūrṇa

त्रिकटु त्रिफला मुस्तं विडञ्चैव विर्डैकम् । एलापत्रञ्च चूर्णानि समभागानि कारयेत् ।।
सर्वमेकीकृतं यावल्लवङ्ग तत्समं भवेत् । सर्वचूर्णद्विगुणितं त्रिवृच्चूर्णं प्रदापयेत् ।।
भोजनादौ तथा मध्ये खादेन्माषाष्टकं शुभम् । सर्वमेकीकृतं यावत्तावच्छर्करयाऽन्वितम् ।।
(भै. र. अम्लपित्ताधिकार २४-२५)

Ingredients

1. *Śuṇṭhi*	-	8 gm.	8. *Vid lavaṇa*	-	8 gm.
2. *Mārca*	-	8 gm.	9. *Vidanga*	-	8 gm.
3. *Pippali*	-	8 gm.	10. *Elā*	-	8 gm.
4. *Haritaki*	-	8 gm.	11. *Tejāpatra*	-	8 gm.
5. *Vibhītaki*	-	8 gm.	12. *Lavarga*	-	88 gm.
6. *Āmalaki*	-	8 gm.	13. *Tṛvṛt*	-	372 gm.
7. *Muṣṭa*	-	8 gm.	14. *Sarkara*	-	528 gm.

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Method of preparation

Drugs No.1 to 13 are made in to fine powder form and it is mixed with fine powder of *sarkara* uniformly.

Dose : 3 to 6 gm (As directed by the Physician).

Anupāna : Honey, Water .

Therapeutic uses

Agnimandya, Malabaṇḍha, Āmlapitta, Ārśa, Prāmeha.

Bhaskara Lavaṇa Cūrṇa

पिप्पली पिप्पलीमूलं धान्याकं कृष्ण जीरकम् । सैन्धवञ्च विडञ्चैव पत्रं तालीशीकेशरम् ।।
एषां द्विपलिकान् भागान् पञ्च सौवर्चलस्य च। मरिचाजाजि शुण्ठी नामेकैकस्य पलं पलम् ।।
त्वगेले चार्द्धभागे च सामुद्रात् कुडवद्वयम्। दाडिमात् कुडवञ्चैव द्वे पले चाम्लवेतसात् ।।
एतच्चूर्णीकृतं श्लक्ष्णं गन्धाढयममृतोपमम्। लवणं भास्करं नाम भास्करेण विनिर्मितम् ।।
जगतस्तु हितार्थाय वातश्लेष्मामयापहमू। वातगुल्मं निहन्त्येतद् वातशूलानि यानि च।।
तक्रमस्तु सुरासीधु- शुक्त काञ्जिकयोजितम्। जाङ्गलानान्तु मांसेन रसेषु विविधेषु च।।
मन्दाग्नेरश्नतः शक्तो भवेदाश्वेव पावकः। अर्शांसि ग्रहणी दोषं कुष्ठामयभगन्दरान् ।।
हृद्रोगमामदोषांश्च विविधानुदरस्थितान् । प्लीहानमश्मरीञ्चैव श्वास कासोदर क्रिमीन् ।।
विशेषतः शर्कराऽऽदीन् रोगान् नानाविधास्तथा।। पाण्डुरोगांञ्च विविधान् नाशयत्य शनिर्यथा।।

(च. द. ६/३९-४७)

Ingredients

1.	*Pippalī*	-	488 gm	10.	*Saurarchala Lavaṇa*	-	1.220 kg
2.	*Pippalīmūla*	-	488 gm	11.	*Marca*	-	244 gm
3.	*Dhāniyak*	-	488 gm	12.	*Śweta Jīraka*	-	244 gm
4.	*Kṛṣṇa Jīraka*	-	488 gm	13.	*Śuṇṭhī*	-	244 gm
5.	*Saindhav Lavaṇa*	-	488 gm	14.	*Dalcini Twak*	-	122 gm
6.	*Viḍa Lavaṇa*	-	488 gm	15.	*Suśma Elā*	-	122 gm
7.	*Tej Patra*	-	488 gm	16.	*Sāmadra Lavaṇ*	-	1.95 kg
8.	*Tālīsh Patra*	-	488 gm	17.	*Dāḍima Bīja*	-	976 gm
9.	*Nāgkeśar*	-	488 gm	18.	*Āmlavetas*	-	488 gm

Method of Preparation

Fine powder of above mentioned drugs (4, 7-9, 11-15 and 17, 18) are mixed with powder of the different salts in mentioned quantity are to be mixed uniformally.

Dose : 1-2 Masa.

Anupāna : *Jāla, Takra, Dadhi, Sidhu, Mostu Kāñji, Māṇs Rasa* etc.

Therapeutic Uses

Those formulation is mentioned ly god *Bhāskāra* for the benefit of the people.

Maṇḍagṇihar, Vatakaphahar, Vatagulma, Vataśūla, Ārśa, Grahaṇi, Kūṣṭha, Bhagaṇḍar, Hṛdaroga,

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Aamdaśa, Plīharoga, Mūtruṣmari, Śwasa, Kāśa, Udar Vikar, Kṛmi roga, Paṇḍu Roga.

Chandanādi Cūrṇa

चन्दनं शाल्मलीपुष्पं त्रिजातं रजनीद्वयम्। अनन्तां सारिवां मुस्तमुशीरं यष्टिकाऽऽमले।।
तालमूलीं शुभां भार्गी देवदारू हरीतकीम्। सर्वद्विगुणितं लौहं चैकत्र परिमर्दयेत्।।
प्रमेहा विंशतिः वासः कांसो जीर्णवरस्तथा। प्राषनादस्य न यन्ति दुर्नामानि च कामला।।

(भै. र. ८८-२२)

Ingredients

1. *Couḍaṇa* - 186gm
2. *Śālmali Pūṣpa* - 186gm
3. *Twak* - 186gm
4. *Elā* - 186gm
5. *Patra* - 186gm
6. *Harīdra* - 186gm
7. *Dāru Harīdra* - 186gm
8. *Śwetā Sāriva* - 186gm
9. *Kṛṣṇa Śārivā* - 186gm
10. *Musta* - 186gm
11. *Uśīra* - 186gm
12. *Yaṣṭīka* - 186gm
13. *Āmala* - 186gm
14. *Talamūli (Syama Musali)* - 186gm
15. *Śubha* - 186gm
16. *Bhāraṇgi* - 186gm
17. *Devadāru* - 186gm
18. *Hārītaki* - 186gm
19. *Lauha (Bhasma)* - 6696gm

Dose : 1gm.

Anupāna : *Honey, Hāridra SŚwarasa.*

Therapeutic uses

Kāsa, Śwāsa, Jīrṇa Jwara, Prameha, Arśa.

Dadimacatuh Sama Cūrṇa

एतद् द्रव्यचतुष्कञ्च दाडिमीफलमध्यगम् पुटपक पयःपिष्टं तद्दाडिम चतुः समम्। (भै. र. ७१-१०१)

Ingredients

1. *Jātiphala* - 2.5kg
2. *Lavanga* - 2.5kg
3. *Śwetajīra* - 2.5kg

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4. Śuddha suhāga - 2.5kg

5. Dāḍimaphala Swarasa (puṭa pāka vidhi)-q.s.

Method of preparation

All above drugs are made in to fine powder and kept in the dadima fruit and heated in putapaka method and collected material is made int to fine poweder and then bhavana is given with *ajādugh, godugdh* water and dried.

Anupāna : Madhu

Therapeutic uses

Āmatisar, āmaśūla.

Eladi Cūrṇa

एला पत्रं नागपुष्पं लवङ्गं । भागरूत्वेषां दौ च खर्जूरकस्य ।
द्राक्षायष्टीशर्करापिप्पलीनां चत्वारस्तत् क्षौद्रयुक्तं क्षये स्यात् ।। (भै. र. १४-३४)

Ingredients

1. Ela - 455 gm
2. Tejpatra - 455 gm
3. Nāgakeśar - 455 gm
4. Lavanga - 455 gm
5. Kharjūra - 910 gm
6. Drākṣa - 1820 gm
7. Muleṭhi - 1820 gm
8. Śarkara - 1820 gm
9. Chhoti pippali - 1820 gm

Method of Preparation

Except *dravśa* all the ingredients made into fine powder and mixed with paste of *Drākṣa* uniformly.

Dose : 1 Māṣa to 3 Māṣa

Anupāna : Madhu

Therapeutic uses

Kṣaya Roga

Gokṣūra (Phala) Cūrṇa

गोक्षुरः क्षुरकोऽपि स्यात्त्रिकण्टः स्वादुकण्टकः । गोकण्टको गोक्षुरको वनश्रैं इत्यपि ।।
पल्लषाश्वदंष्ट्रा च तथा स्यादिक्षुगन्धिका । गोक्षुरः शीतलः स्वादुर्बलकृद्बस्ति शोधनः ।।
मधुरो दीपनो वृष्यः पुष्टिदश्चाश्मरीहरः । प्रमेहश्वासकासार्शःकृच्छ्रहृद्रोगवातनुत् ।।

(भा.प्र.गुडूच्यादिवर्गः ४४-४६)

Ingredients

Gokśūraphala.

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Method of Preparation

After grading *Gokśūraphala* is made into fine powder form.

Dose : 3 to 6 gm (As directed by the Physician).

Therapeutic uses

Aśmari, Prameha, Śwāsa, Kāsa, Arśo-Roga, Mūtrakṛcchra, Hṛdroga, Vātaroga.

Hingvāṣṭaka Cūrṇa

त्रिकटुकमजमोदा सैन्धवं जीरके द्वे । समधरणधृतानामष्टमों हिङ्गुभागः ।।
प्रथमकवलभुक्तं सर्पिषश्चूर्णमेतज्जनयति जठराग्निं वातरोगाश्च हन्ति ।। (भै० रत्ना० अग्निमान्द्य ५९)

Apparaturs Required

Khalva yantra, cloth, tray etc.

Drugs required

Śuṇṭhi	:	*1 part*
Marica phala	:	*1 part*
Pippalī phala	:	*1 part*
Ajamoda	:	*1 part*
Saiṇḍhava lavaṇa	:	*1 part*
Svetajīraka	:	*1 part*
Kṛṣṇajīraka	:	*1 part*
Hingu (ghṛta bharijita)	:	*1/8 part*

Procedure

Except *hingu* all other 7 drugs are taken in mentioned quantity and made into fine powder form separately, then filtered with cloth. *Hingu* should be made *bharjana* with *Goghṛta*, then powdered. After that all the 8 drugs mixed together uniformely and ones again filtered with cloth. This recipe is called *Hingvāṣṭaka cūrṇa* and it should be packed in air tight glass containers or plastic jars.

Mātra : 1 to 4 gms.

Anupāna : Gḥrta.

Karma : Jaṭharāgni pradīpaka .

Āmayika prayoga

Vātaroga, pravāhika, gulma, udāvarta, anāha, agnimāndhya, udaraśūla , aruch etc.

(some of the scholars mentioned that, for the preparation of *hingvāṣṭaka cūrṇa*, *Hingu* also should be taken in equal quantity, provides *ugragandha* to the *cūrṇa* and it becomes difficult for consumption of *cūrṇa*, hence it is better to take 1/8 part of *hingu* only).

Lavaṇabhāskara Cūrṇa
(Bhāskara Lavaṇa Cūrṇa)

सामुद्रलवणं कार्यमष्टकर्षमितं बुधैः । पञ्च सौवर्चलं ग्राह्यं बिडं सैन्धवधान्यकात् ।।
पिप्पली पिप्पलीमूलं कृष्णजीरकपत्रकम् । नागकेशरतालीसम्लवेतसकं तथा ।।

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द्विकर्षमात्राण्येतानि प्रत्येकं कारयेद्बुधः । मरिचं जीरकं विश्वमेकैकं कर्षमात्रकम् ।।
दाडिमं स्याच्चतुष्कर्ष त्वगेले चार्धकार्षिके । एतच्चूर्णीकृतं सर्वं लवणं भास्कराभिधम् ।।
शाणप्रमाणं देयं तु मस्तुतक्रसुरासवैः । वातश्लेष्मभवं गुल्मं प्लीहानमुदरं क्षयम् ।।
अर्शांसि ग्रहणीं कुष्ठं विबन्धं च भगन्दरम् । शोफं शूलं श्वासकासावामवातं च हृद्रुजम् ।।
मन्दाग्निं नाशयेदेतद्दीपनं पाचनं परम् । सर्वलोकहितार्थाय भास्करेणोदितं पुरा ।।

(शा० सं० मं० ख० ६.१३८-१४४)

Apparaturs required

Khalva yantra, cloth, tray etc.

Drugs required

Sāmudra lavaṇa	:	*8 karṣas (96 gms.)*
Souvarca lavaṇa	:	*5 karṣas (60 gms.)*
Biḍa lavaṇa	:	*2 karṣas (24 gms.)*
Saiṇḍhava lavaṇa	:	*2 karṣas (24 gms.)*
Dhānyaka	:	*2 karṣas (24 gms)*
Pippalī phala	:	*2 karṣas (24 gms.)*
Pippalī mūla	:	*2 karṣas (24 gms.)*
Kṛṣna jīraka	:	*2 karṣas (24 gms.)*
Patra	:	*2 karsas (24 gms)*
Nāgakeśara	:	*2 karṣas (24 gms)*
Tālīsa patra	:	*2 karṣas (24 gms)*
Āmlavetasa	:	*2 karṣas (24 gms)*
Marīca	:	*1 karṣas (12 gms)*
Jīraka	:	*1 karṣas (12 gms)*
Viswa(Śuṇṭhi)	:	*1 karṣas (12 gms)*
Dāḍima	:	*4 karṣas (48 gms)*
Twak	:	*karṣas (6 gms)*
Ela	:	*karṣas (6 gms)*

Procedure

All above mentioned drugs are taken in mentioned quantity and made into fine powder form separately, then filtered with cloth and all the drugs are mixed together uniformely. This recipe known as *Lavaṇa Bhāskara cūrṇa* and it was formulated in the past by air tight glass containers or plastic jars.

Matra : 1 *Ṣāṇa* (4 gms).

Anupāna : *Mastu, takra , āsava,* warm.water.

Karma : *Dīpana , pācana.*

Āmayika prayoga

Vāta kaphaja gulma, plīha, udarā, kṣaya, arśas, grahaṇī, kuṣṭha, vibandha, bhagandara, śopha, śula, śwasa, kāsa, āmavata, hṛdroga, mandāgni.

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Layi Cūrṇa (Bhānga Cūrṇa)

(भावप्रकाश)

Ingradients

1. Bhāṅga

Dose : 125mg.

Therapeutic Uses

Atisār, Tamaka śwāsa, Kāsa, Anidra, Manasik roga.

Palāsabijādi Cūrṇa

पलाशबीज स्वरसं पिवेद्वा क्षौद्रसंयुक्तम् । पिबेत्तद्बीजकल्कं वा तक्रेण क्रिमिनाशम् ।।

(भै. र. कृमिरोगचिकित्सा प्रकरणम् ११-१५)

Ingredients

Palāsh bija swaras /Palas bij - 500 gm

Method of Preparation –

Palāsh bija swaras is taken and *Palāsh* seed is grinded over stone with water and paste is made.

Anupāna : 1. *Palāsh Seed's swaras* -1Tola + 2. *Palāsh Kalka*-1 Tola Or Honey

Therapeutic Uses

Kṛmi

Puṣyānug Cūrṇa

पाठाजम्बुवाम्रयोर्मध्यं शिलाभेदं रसाञ्जनम् । अम्बष्ठकीमोचरस समङ्गापद्मकेशरान् ।।
वाह्लीकातिविषामुस्तं बिल्वं लोध्रं सगैरिकम् । त्रिफलां मरिचं शुण्ठीमृद्धीका रक्त चन्द नम् ।।
कट्वङ्गवत्सकानन्ताधातकीमधुकार्जुनम् । पुण्येणोद्घृत्य तुल्यानि सूक्ष्मचूर्णानि कारयेत् ।।
तानि क्षौद्रेण संयुन्य पाययेत् तण्डुलाम्बुना । असृग्दरातिसारेषु रक्तं यच्चोपवेश्यते ।।
दोषागन्तुकृता ये च बालाना ताञ्चनाशयेत् । योनिदोषं रजोदोष श्वेतं नीलं सपीतकम् ।।
स्त्रीणां श्यावारूणं यच्य तत् प्रसध्य निवर्त्तयेत् । चूर्णं पूण्यानुगं नाम हितमात्रेयपूजितम् ।।
अम्बण्ठां दक्षिणे ख्याता गृह्णन्त्यन्ये तु लक्ष्मणाम् । (च. द. ६१/१३-१८)

Ingredients

1. *Pāṭha* *417 gm*
2. *Jambu (Bija Majja)* *417 gm*
3. *Āmra (Bija Majja)* *417 gm*
4. *Pāṣāṇa Bhada.* *417 gm*
5. *Rasāñjana* *417 gm*
6. *Ambaṣṭaki* *417 gm*
   (in case of non availability pāṭha is to be taken)
7. *Mochrasa* *417 gm*
8. *Manjiṣṭha* *417 gm*

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9.	*Padmakeśara*	*417 gm*
10.	*Bahlika (KumKuma)*	*417 gm*
11.	*Ativiṣa*	*417 gm*
12.	*Masta*	*417 gm*
13.	*Bilvaphalamajja*	*417 gm*
14.	*Lodhra*	*417 gm*
15.	*Śuddha Garika*	*417 gm*
16.	*Triphala*	*417 gm*
17.	*Marich*	*417 gm*
18.	*Śuṇṭhi*	*417 gm*
19.	*Drākṣa*	*417 gm*
20.	*Raktacandan*	*417 gm*
21.	*Kaṭvaṅga*	*417 gm*
22.	*Kuṭaja (Vatsaka)*	*417 gm*
23.	*Śweta Sāriva (Ananta)*	*417 gm*
24.	*Dhātaki*	*417 gm*
25.	*Madhūka (Yaṣṭi)*	*417 gm*
26.	*Arjuna*	*417 gm*

Method of Preparation

All above mentioned drugs are made fine powder form.

Dose : 2-4 Māṣa

Anupāna : *Taṇḍulodaka*

Theurapeutic Use

Aśrgdhara, Raktātisara, Rajodoṣa.

Śatapuṣpa Cūrṇa

शतपुष्पा विऽङ्गञ्च सैन्धवं मरिचं समम् । चूर्णमुष्णाम्बुना पीतमग्निसंदीपनं परम् ।। (भै.र., रसायन २९/३९)

Ingredients

1. *Somph* - *2.6 kg*
2. *Vāyuviḍanga* - *2.6 kg*
3. *Marica* - *2.6 kg*
4. *Saindhavlavaṇa* - *2.6 kg*

Method of preparation

Above said ingredients are mixed and Powdered.

Dose : 1/2 to 1 tola

Anupāna : Luke warm water.

Therapeutic Uses

Agnidipan

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Ṣaṭsakār Cūrṇa

स्वर्णपत्री चतुर्भागा शिवा स्वल्पा द्विभागिकी। सौवर्चलं सैन्धवं च शुण्ठी च शत पुष्पिका।।
प्रत्येकं चैकभागं स्यात् सर्वमेकत्र चूर्णयेत्। षटसकारमिदं चूर्ण षण्माषकमितं सदा।।
उष्णोदकेन संसेव्यं सुखदं रेचनं परम्। शस्त्रिराजेश्र्वरैरेतत् परीक्षितमक्षिसिति।।

(भै. र. अनु योग)

Ingredients

1. *Swarṇa patri (Sanay)* 4 kg
2. *Haritaki (Small)* 2 kg
3. *Sauvarchala Lavaṇa* 1 kg
4. *Saindhav Lavaṇa* 1 kg
5. *Suṇṭhi* 1 kg
6. *Śatapuṣpa* 1 kg

Method of Preparation

All the above mentioned drugs are powdered & mixed property.

Dose : 6 *Māṣa*

Anupāna : Luke warm water.

Sitopalādi Cūrṇa

सितोपला षोडश स्यादष्टौ स्याद्वंशरोचना ।।
पिप्पली स्याच्चतुष्कर्षा स्यादेला च द्विकार्षिकी। एकः कर्षस्त्वचः कार्यश्चूर्णयेत्सर्वमेकतः ।।
सितोपलादिकं चूर्णं मधुसर्पिर्युतं लिहेत्। श्वासकासक्षयहरं हस्तपादाङ्गदाहजित् ।।
मन्दाग्निं सुप्तजिह्वत्वं पार्श्वशूलमरोचकम्। ज्वरमूर्ध्वगतं रक्तं पित्तमाशु व्यपोहति ।।

(शा. सं. म. ख. ६/१३४-१३७)

Apparatus required

Khalva yantra, cloth, tray etc.

Drugs required

Śītopala (sugar candy)	:	16 parts
Vamṣalocana (tavakṣīri)	:	8 parts
Pippalī phala	:	4 parts
Ela	:	2 parts
Twak (dālchini)	:	1 part

Procedure

Above mentioned all the drugs are to be taken in mentioned quantity and made in to powder form separately, then filtered with cloth and all the drugs are mixed together (while sita i.e. sugar candy has to be powdered at last and mixed together). Compound form of powder once again filtered with cloth and preserved in glass containers. This recipe known as *Sitopalādī cūrṇa* taken with *madhu*, *ghṛta* relieves following disorders.

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Therapeutic uses

Swāsa, kāsa kṣaya, hastapādānga dāha (burning sensation of palms, soles and body), *mandāgni, suptajihwa* (loss of taste in the tongue), *pārśwa śūla*, arocaka , *jwara, ūrdhwagata raktapitta.*

(This *sitipalādi cūrṇa* because of *dālcini, ela* provdies pleasant odour and sugar candy provides good paoatability, hence this *cūrṇa* acceptance is more with comparing to other *cūrṇas*).

Dose : 1 to 3 gm

Anupāna : Mixed with Ghee, Honey etc.

Tālīsādi Cūrṇa

तालीसं मरिचं शुण्ठी पिप्पली वंशलोचनम् ।।
एकद्वित्रिचतुः पञ्चकर्षैर्भागान्प्रकल्पयेत् । एलात्वचोस्तु कर्षार्धं प्रत्येकं भागमाचरेत् ।।
द्वात्रिंशत्कर्षतुलिता प्रदेया शर्करा बुधैः । तालीसाद्यमिदं चूर्णं रोचनं पाचनं स्मृतम् ।।
कासश्वासज्वरहरं छर्द्यतीसारनाशनम् । शोषाध्मानहरं प्लीहाग्रहणीपाण्डुरोगजित् ।।
पक्त्वा वा शर्करां चूर्णं क्षिपेत्स्याद्गुटिका ततः । (शा. सं. म. ख. ६.१३०-१३४)

Apparatus required

Khalva yantra , cloth, tray etc.

Drugs required

Tālīsa patra	:	1 *karṣa* (12 gm)
Marica phala	:	2 *karṣa* (24 gm)
Śuṇṭhi	:	3 *karṣa* (36 gm)
Pippalī phala	:	4 *karṣa* (48 gm)
Vaṃśalocana	:	5 *karṣa* (60 gm)
Ela	:	Half *karṣa* (6 gm)
Twak	:	Half *karṣa* (6gm)
Śarkara	:	32 *karṣa* (384 gm)

Procedure

All above mentioned drugs are taken mentioned quantity and made into fine powder form separately, then filtered with cloth and all the durgs are mixed together uniformely. This recip known as *tālīsādi cūrṇa* and it should be packed in air tight glass containers or plastic jars.

Karma : *Rocana, pācana.*

Āmayika prayoga

Kāsa, swāsa, jwara, cārdi, atisāra, śoṣa, ādhmāna, plīhā, grahaṇi and pāṇḍuroga.

Matra : 1 to 4 gms.

Anupāna : Madhu.

This powder can be made into *Gutika* by cooking it with sugar.

Triphala Cūrṇa

पथ्याविभीतधात्रीणां फलैः स्यात्त्रिफला समैः । (भा. प्र. हरीतक्यादिवर्ग ४१)

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Ingredients

1. *Haritaki* *1 Part*
2. *Vibhitaki* *1 Part*
3. *Āmalaki* *1 Part*

Method of Preparation

All above mentioned drugs (dried fruit pulp) are collected and made in to fine powder form with the help of machine.

Dose : 3 to 6 Gm As directed by the Physician.

Anupāna : Ghee, Honey and Warm Water.

Therapeutic Uses

Anāha, Prameha, Netra roga.

Vaiswānara Cūrṇa

माणिमन्थस्य भागौ द्वौ यमान्यास्तद्वदेव हि । भागास्त्रयोऽजमोदाया नागराद् भागपञ्चकम् ।।
दश द्वौ च हरीतक्याः लक्ष्णचूर्णीकृतः शुभाः । मस्त्वारनालतक्रेण सर्पिषोष्णोदकेन वा ।।
पीतं जयत्यामवातं गुल्म हृद्वस्तिजान् गदान् । प्लीहानं ग्रन्थिशूलादीनशास्यानाहमेव च ।।
विबन्धं बातजान् रोगांस्तथैव हस्तपादजान् । वातानुलोमनमिदं चूर्ण वेश्वानरं स्मृतम् ।।

(भै. र. आमवातचिकित्सा ४८-५१)

Ingredients

1. *Saindhavalavaṇ* - *84 gm*
2. *Ajavain* - *84 gm*
3. *Ajamoda* - *126 gm.*
4. *Śuṇṭhi* - *210 gm.*
5. *Haritaki* - *504 gm.*

Dose : 1-2gm

Anupāna : *Takra, Kāñji, Uṣṇajal, Ghṛta*

Therapeutic Uses

Āmavata, Gulma, Hṛdayarog, Śula, Arśa, Plīharoga, Granthiroga.

Yavānikhāṇḍava Cūrṇa

यवानी दाडिमं शुण्ठी तिन्तिडीकाम्लवेतसौ । बदराम्लं च कुर्वीत चतुःशाणमितानि च ।।
सार्धद्विशाणं मरिचं पिप्पलौ दशशाणिका । त्वक्सौवर्चलधान्याकं जीरकं द्विद्विशाणकम् ।।
च्तुःषष्ठिमितैः शाणैः शर्करामत्र योजयेत् । चूर्णितं सर्वमेकत्र यवानीखाण्डवाभिघम् ।।
चूर्ण जयेत्पाण्डुरोग हृद्रोगं गंहणीं ज्वरमृं । छर्द्धिशोधातिसारांश्च प्लीहानाहविबन्धताः ।।
अरूचिं शूलमन्दाग्निमर्शोजिह्वागलामयान । (शा.ध.सं. मध्यमखण्ड ६/१२६-१३०)

Ingredients

1. *Yavāni* - *372 gm*

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2. *Dāḍima* - *372 gm*
3. *Śuṇṭhi* - *372 gm*
4. *Tintiḍīka* - *372 gm*
5. *Āmlavetasa* - *372 gm*
6. *Badarāmla* - *372 gm*
7. *Marica* - *232 gm*
8. *Pippali* - *930 gm*
9. *Twak* - *186 gm*
10. *Dhānya* - *186 gm*
11. *Sauvarcalalavaṇa* - *186 gm*
12. *Jiraka* - *186 gm*
13. *Sugar* - *5.952 kg*

Dose : 4gm

Therapeutic Uses

Pāṇḍuroga, Grahaṇi, Jwara, Chardi, Anāha, Atisāra, Aruci, Śūla, Mandāgni, Arśa, Vibhanda, Jihwagataroga, Galagataroga.

Capsules

Capsules are increasing in popularity day by day because of their advantage. Capsules are the solid unit dosage form of medicament in which are drug(s) enclosed in a practically tasteless, hard or soft soluble container or shell made up of a suitable form of gelatin. Hard capsules are used for filling the solid substances. Whereas soft capsules are used for filling the liquids and semisolids.Hard capsules come second to tablets in importance as solid unit dosage forms. Some of the capsules are administered through rectum or vagina and are convenient mode of administration of drugs than suppositories. For oral administration the capsule is placed on the tongue and swallowed with a drink of water.

Advantages

1. It is elegant preparation.
2. Easily portable
3. Ease of use.
4. It can be easily swallowed , due to its slippery surface.
5. It is tasteless.
6. It can mask the odour, taste and colour of the medicament.
7. They are available in various shapes, size and colours.
8. It protects the medicament from atmospheric effects.
9. It is physiologically inert.
10. Economy in large production.

The types of capsules

Hard gelatin capsules

Shells of the capsules are prepared from a mixture of gelatin, sugar and water. These shells are

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prepared in two sections. The capsule body and the shorter cap. It may be coloured or colourless transparent or non transparent and used for filling solid medicaments.

Soft gelatin capsules

Shells are made from gelatin, water, glycerin or sorbitol. It is used for filling liquid, semisolid or powder preparations. Sheapes may be round, oval, oblong or tube like. Single application eye ointments may be given in a soft gelatin shell, for better application. E.g. *Kṣīra balā taila capsules*.

Hard capsules are available in various sizes ranging from the largest (000) to the smallest(5) . The capacity of the capsule varies according to the bulk density of the medicament, with or without a diluent, and the pressure applied during filling. the capsules are used to encapsulate drugs with weights between 65 mg and 1 gm. With or without a diluent. As given above, the smallest capsule(no. 5) is capable of holding drugs powder weighing 65 mg. In order to fill the capsule completely, a minimum of about 65 mg material is required . If the dose of the drug or the volume of the material to be filled in a capsule is inadequate, then the use of diluent is necessary.

Properties of powder to be filled

The powder to be filled in the capsule may create problems because of poor flow property. This is because of

1. Attractive forces between the particle inhibit plastic flow or dilatency.

2. Particle size, density of material, porosity, shapes and surface texture also affect the flow of powder.

Powders with small particles (less than 10 micron) resist flow due to cohesive forces between the particles. However, flow can be improved by removing these particle from the bulk. Absorbed moistrue (moisture content) also effects the flow of bulk powder.

Hence, to improve the flow property of the powder to be filled in a capsule, its moisture content is regulated by drying. Mixing and filling of the capsule is carried out in a dehumidified atmosphere, at room temperature (about 30 percent relative humidity and 70 to 75^0 F temperature). The rate of flow of a powder may also be improved by using glidants like stearic acid, stearates, talc or glycol ester in small proportions, upto 1 to 2 percent.

Demixing of the powder to be filled in a capsule may also create problems. This can be solved by regulating the particle size of the material and by controlling bulk density.

Packing of capsules

Ejected capsules are polished on cloth, with or without inert oil. This is a manual operation . Polishing may also be effected in a coating pan using a polyurathane or cheese cloth liner placed in the and revolving the capsule in the pan. Then, the capsules are packed in a strip pack or in a blister pack, using plastic material having low moisture vapour transfer rates. Plastic or dry glass bottles may also be used along with a dehydrating agent (silica gel in the muslin bag). Such packing is desirable for hard as well as soft gelatin capsules.

Special applications of capsules

Pastes, oils and liquid medicaments can also be given in accurate doses.

It permits liquid medication to be handled and transported easily.

Disintegration and dissolution of the drug shows better results than other solid dosage forms.

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The capsule dosage form can be easily altered or adjusted, as per the need of bioavailability of the drug.

Vaṭi Kalpanā

Definition

तस्य समस्तद्रव्यौपरिदत्यागाद् आप्लुतोपयोगाच्च कल्कादभेदः । (अष्टाङ्गसंग्रह क० ८)

Vaṭi kalpanā is the outcome of *kalka kalpanā*. Later on, *Śaraṅgadhara* in his *Śārangadhara samhitā* has mentioned a specific chapter for preparing *vaṭi* by specific techniques.

Vaṭi is usually prepared with the combination of *kaṣṭouṣadhi dravya cūrṇa, bhasma, suddha, rāsoparasa, sādhāraṇa rasa, guḍa, śarkara, guggulu, jala, swarasa, mūtra,* tce. Drugs combination.

Vati (tablet), *guṭika* (pills) and *modaka* (large size pills) etc. are presented as tablets or pills. These are made of various drugs, of metals, minerals, gems animal products and vegetable origin.

वटकाश्चाथ कथ्यन्ते तन्नाम गुटिका वटी । मोदको वटिका पिण्डी गुडो वर्तिस्तथोच्यते ।।
लेहवत्साध्यते वह्नौ गुडो वा शर्करा तथा । गुग्गुलुर्वा क्षिपेत्तत्र चूर्णं तन्निर्मिता वती ।।
कुर्यादवह्निसिद्धेन क्वचिद्गुग्गुलाना वटीम् । द्रवेण मधुना वाऽपि गुटिकां कारयेद्बुधः ।।

(शा० सं० म० ख० ७.१-३

According to the *Ācārya Śāraṅghadhara* the imformation about *Vaṭikalpanā* is mentioned like this. *Guṭima*, *Vaṭi*, *Modaka*, *Vaṭika*, *Pinḍi*, *guḍa*, *Varti*(tablets, bolus, pills, draggees) are synonyms of *Vaṭikalpanā* (these are the names given for *vaṭi kalpanā* on the basis of shape, dose, root of administration eg. *Varti* etc.). It is prepared either by cooking the powder of drugs with jaggery, sugar, or *guggulu* or without cooking, by maceratine the powder with any liquid like honey and *guggulu* then rolling into pills.

सिता चतुर्गणा देया वटीषु द्विगुणों गुडः । चूर्णाच्चूर्णसमः कार्यो गुग्गुलुर्मधु तत्समम् ।।
द्रवं च द्विगुणं देयं मोदकेषु भिषग्वरैः । कर्षप्रमाणं तन्मानं बलं दृष्ट्वा प्रयुज्यते ।।

(शा० सं० म० ख० ७.४-५)

If sugar to be added, it should be taken four times to the quantituy of powdeer. Other drugs like salt (*aindhavalavaṇa*), *kṣāras* (alkalies), *guggulu* honey are to be added in equal quantity to that of powder. All these contents to be macerated with twice the quantity of water, then rolled into pills of one *karṣa pramāṇa* each. Then this material should be dried in shade and preserved. They are used in accordency with the strength of the patient.

Above mentioned ratio of different sweetening agents and additives etc. are prescribned by *ācāryas* is general and during *vaṭi* preparation according to the necessity *vaidya* can alter the ratio of these ingredients slightly for the preparation of the *vaṭi*.

Guṭīka can be compared with pills, where as *vaṭi* can be compared with tablets. *Vaṭika*, *vaṭi*, *cakrika* are having similar shape to that of tablet, but varies in sise. *Guṭika*, *guḍa* are having similar shape to that of pills, but varies in size.

If more quantity of medicine is expected to be given then it should be moulded into *vaṭaka, pinḍa., modaka* form which are comparatively bigger in size and having similar shape to that of *vaṭi*. *Vaṭaka* can be prepared with more tham the quantituy of 500 mg. Medicine.

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Vaṭi and guṭika

They will be having small in size and whenever small and whenever small quantity of medicine is supposed to be given then medicine should be moulded in to *vaṭi* and *guṭika* form.

It is prepared either by cooking the posder of drugs with jaggery, sugar, *guggulu*, or without cooking, by macerating the powder with any liquid like honey and *guggulu* then rolled into pills . If sugar to be added, it should be taken four times to the quantity of powder. Other drugs like salt (*Saindhava lavaṇa*), *Kṣāra* (alkalies), *guggulu*, honey are to be added in equal quantity to that of powder. All these contents to be macerated then material should be dried in shade and preserved. They are used in accordency with the strength of the patient.

Method of preparation

The vegetable drugs are dried and made into fine powders, separately, The menerals, metals, gems are reduced to *bhasma* or *sindūra*, unless otherwise mentioned, anoimal products are puried if necessary. In cases where *pārada* and *gāndhaka* are mentioned, *kajjali* is made first then other drugs are added, one by one, according to the formula. The requisity quantity of these drugs are taken and mixed. Then this mixture is put into *khalva* and ground to a soft paste with the prescribed liquids. When more than one fluid is mentioned for grinding, they are to be added one after another.In case no liquied is mentioned, water can be added. When the mass is properly ground and is in a condition of *mātrapāka* to be made into pills, *sugandha dravyas* like *kasturi, karpur* etc., if mentioned , are added and ground again. The criterion to determine the final stage before making pills is that it should not stick to the fingers when rolled. From out of this, pills of specified size are prepared. Pills can be made manually or by pill making machine. Pills may be dried in shade or under the sun in accordance with the textual directions.

The *vaṭi* when made without cooking the powder is mixed and macerated with the clean and pure new *guggulu* or jaggary in proper quantity. It is hammered by adding slight amount of *ghṛta* time to time to time to make it soft and smooth. Even if the *guggulu* is to be added with some vegitable drugs are alone, it has been suggested by *Kāsi Rām*, the commentator of *Sāraṅgadhara saṁhitā* in his commentry *gūḍarthadipika* that *kuṭṭanam* of the meterial should be done to prepare good *vaṭi*.

In case where sugar or jagary (*guḍa*) is mentioned, *pāka* of these should be made in low fire and removed from the oven. The powders of the ingredients are added to the *pāka* and briskly mixed. When still warm, *gaṭikas* should be rolled into pills in the requisite size and allowed to cool, then dried in shade. Instead of pills now a days, these recipes are being prepared in tablet form in tablet making machines. For this purpose in large scale manufacture of pills and tablets, the preparation of the paste of drugs is done by eletrically driven mortars and grinders. For making pills or tablets, pill and tablet pressing machines are used which produce pills or tablets of uniform size and weight in large numbers within a short time. Counting is also done by machine.

If *guggulu* is one of the ingredient, then no binding meterial is needed.

The final appearance of the *vaṭi* depends upon the fineness of the powder used if the powder is coarse, the *vaṭi* will be rough and cracked besides being round, smooth and shiny .By the coarse powder, the processing of *vaṭi* becomes difficult. To make *vaṭi* round, smooth and shiny they are allowed for rolling over a deep plate smeared with ghee or decoction.

Preservation and characteristics

Pills made of vegetable origin kept in air tight containers can be used within two years . Pills made

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of minerals can be used for an indefinite period.

Guṭikas and *vaṭis* should not lose their original colour, smell, taste and form. When sugar, salt or *kṣara* is an ingredient, the pills should be kept away from moisture.

Some of the practical aspects of vaṭi kalpanā

1. Medicinal drug is made into fine powder form and made into paste form by utilizing *dugdha, swaras, kwātha, madhu* like liquids and *guḍa pāka, śarkara pākas*, in *khalva yantra* or in vessel and this paste is moulded into *guṭika* like form of medicine.
2. While preparing *vaṭi*, *swarasa*, etc. *drava dravya* are taken first in *khalva yantra* and trituration is done by adding *auṣada dravya cūrṇa* little by little after properly mixing the primary curna, then rest of the curna is added and triturated.
3. If *vamsalocana* is mentioned in the *vaṭi* formula, first *vamsalocana* has to be grinded with little *cūrṇa*, then rest of the curna little by little has to be incorporated and mixed well.
4. If *guḍūci satva, dāruharidra satva* are supposed to be mixed, first of all those satva are to be powdered and mixed in water, then rest of the medicinal drug powders are added little by little and mixed together after that total substance is grinded in *khalva yantra*. Then this substance is to be moulded into *vaṭi* form.
5. If *kajjali*, *dhātu bhasma* etc. are supposed to be mixed, it should be observed that, they are properly prepared and then only added in *khalva yantra* and grinded . After that while grineing, the rest of the *kāṣṭouṣadhi dravya cūrṇa* are added little by little to facilitate proper mixing.
6. *Vatsanābhi,rasakarpūra, rasapuṣpa* etc. *tīkṣna dravyas* first of all they should be made into micro powder form in *khalva yantra* then mixed with other ingredients.
7. *Modaka, vaṭaka* etc.which are very big in size, they are very difficult to swallow, hence they are advised to kake powder form while administration.
8. Some of the *vaṭi* which are made with *guggulu* does not disintegrates properly and sometimes they come out as it is with stool mass hence such *vaṭis* has to be powdered and taken while administration.
9. Some of the rasouṣadhis, it is better to powder them while administration, so that they will undergo for a digestion, and absorption fast, hence facilitates quick results Ex. *Laxmivilāsa rasa, mṛtyunjaya rasa.*
10. If *dugdha*, *swarasa, kwātha* etc. liquids are taken for *bhāvana*, those liquids should be taken in the quantity quantity by which total quantity of drug powder can able to be completely immersed in *khalva yantra*.
11. Sugar and jaggery are used, by making them into syrup form (*pāka*) then drug posder is supposed to be mixed. Guggulu can be used by making paka with water and mising with respected drug powders. *Guggulu* also can be used by making *pāka* with *ghṛta* and mixed with drug powders to make *guṭika kalpanā*. The quantity of guggulu should be equal to that of drug powder. If *vaṭi* is made by *guggulu pāka* and drug powder combination, the drug powder has to be mixed at one particular place of *guggulu pāka* i.e. *guggulu* with water has to be boiled till it attains equal characters of *guḍa pāka* and this *pāka* should be in concentrated form and it should sink in the water (it should not dissolve in water and having stability) when little quantity of guggulu paka tested in a water containing container. During that state of *guggulu pāka* medicinal drug powders has to be mixed and contents are rolled into vati form. If *guggulu*

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is to be used directly without making *pāka* first *suddha guggulu* and *auṣadha dravya* has to be mixed in *khalva yantra* and by adding little by little *ghṛta*, contents has to be mixed uniformly and molded into vati form. The *ghṛta* has to beadded till the content reaches semisolid state by which *vaṭi* can be made.

12. Some of the *guṭika* are advised to make dry with sunlight after their preparation and some of the *guṭika* are advised to make dry in shade (*chāyasuṣka*) . according to specifications mentioned for drying of *guṭika*, must and should be followed . Because the drugs which are photosensitive, they are advised to dry in shade (*chāyasuṣka*) and drugs which can tolerate to sunlight and drugs which cn get more potency by exposing to sunlight are might have advised to dry with sunlight.
13. Drying is an important operation in pharmaceutical pracrtice. It is important that the moisture remaining should be low enough to prevent product deterioration. The term drying usually infers the removal of relativfely small amounts of water from solid material and the term evaporation is usually limited to the removal of relativgely large amounts of water from solutions. In drying processes, the major emphasis is usually on the solid product. In most cases drying involves the removal of water at temperatures below its boiling point, where as evaporation means the removal of water by boiling a solution. Another distinction is that, in evaporation, the water is removed from the material as practically pure water vapour, mixed with other gases only because of unavoidble leaks. In drying, on the other hand, water is usually removed by circulating air or some other gas over the material in order to carry away the water vapour.

In some cases, drying involves converting a set vegitable drug e.g. *guḍūci*, into a free flowing solid. Drying is also an important stage in some formulating operations, notably during tableting by wet granulation etc.

Specifications has to be followed during administration of vaṭi

Vaṭi which are made by *bhasma* etc. *rasa* drugs will be having high strength. Where as *guṭi* which are made by herbal remedies will be having smooth nature Hence they can be given safely to sensitive, strengthless and chronic patients.

Guggulu vaṭi and another some varieties of *vaṭi* will be possesing slow drug action over the body.Hence they can be administered very safely without having fear of rapid drug adverse reactions. For which taking *guggulu*, dietic restrictions have to be followed.

If the toxic drugs are mentioned under formulae of vati they should be mixed after their prescribed purification only .

The *vaṭis* which are specifically mentioned to dry them with sunlight, they has to be must and should dried under sunlight only. If there is no any specification then *vaṭis* has to be dried in shade (*Chāya Suṣka*) and free air. After drying *vaṭis* they have to be preserved in glass containers.

While consuming hard consistency *guṭika* e.g. *Dhātri Loha Guṭika*, it has to be made into powder form and mixed with *anupāna* then only they are supposed to be administered. So that, its action will be rapid. Otherwise because of their hard consistence *guṭika* without getting disintegrated, they will be expelled as it is along with fecal matter.

Vaṭi's which are made by *nimburasa* or *āmlaras* should not be dried by keeping over enamil mae vessels. Because medicines over earthen pots only. After complete drying of vatis only they has to be preserved in glass containers. Without drying properly *vaṭi* should not be collected into glass containers.

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If at all they getting spoiled soon. After complete drying never *vaṭi's* kept freely. They should be filled in a container as early as possible to prolong there stability period.

Vaṭi's which contains *ahiphena* etc. norcotic drugs there container must and should be specificallyt labelled with precautions while consuming .

Vaṭi's which contains *jamāl guṭha* as a ingredient should be labelled contra indication for intake in cases of childrens, pregnant, ladies, old age, *kṣaya roga* and sensitive patients, at all physician want to give even in such cases also medicine has to be given in very low dose.

Vaṭaka, modaka, pinḍi, guḍa, varti, vaṭi, vaṭika, guṭika etc. different names are mentioned because of their variation in size and shape.

Guṭika

If the medicine is rolled into small circular shape masses, then it is called *guṭika*, this can be compared with pills, in modern pharmaceutics.

Vaṭi

Vaṭi is made in the shape of flat circular mass hence it is similar to tablet.

Guda

Kāṣṭouṣadhi cūrṇa is mixed with gudapaka and prepared product is called *guḍa*.

Guggulu

Kāṣṭouṣadhi cūrṇa and *bhasma* etc. are mixed with *guggulu* and *guṭi* or *vaṭi* is prepared then it is called *guggulu kalpanā* .

Varti

If the *guṭika* or *vaṭi* medicine is modified into this long oval shaped solid form, then it is called as *Varti Kalpanā*. This is commonly used for local administration of following routes viz. Guda(anus), *Yoni* (*vagina*), *Sisna* (*penis*), *Netra* (*Eye*). According to the specific route of drug administration, the length and diameter of the *Varṭi* will be modified.

Vaṭaka

If medicine is made in to big circular mass form then it is called *vaṭaka*.

Piṇḍa or piṇḍi

Auṣadhidravya cūrna is mixed with *śarkara* and medicine is moulded like *pinḍa* and called as *pinḍa* or *pinḍ kalpanā* (2 to 5 *tula* wt. Medicine or big *āmalaki* size medicine if rolled into circular shape then it is called *pinḍa*).

Modaka

It will be having circular shape and having big size usually it is prepared with medicine possesing weight around 20 gms. 50 gms, 100 gms. Ofaround big lemon fruit size medicine if rolled into circular mass form then it is called *modaka*. If more quantity of medicine is supposed to be given , then it can be given in the form of *pinḍa* or *modaka*.

Apatantrahara Vaṭi

(सिद्धयोगसंग्रह वातरोगाधिकार २०/१०९)

Ingredients

1. *Śuddha hingu* - *143 gm*

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2. *Karpūr* - *143 gm*
3. *Gañja* - *143 gm*
4. *Kurasāni ajavayin* - *286 gm*
5. *Tagar* - *286 gm*
6. *Jaṭamāmsi Phāṇṭa* - *q.s.*

Dose : 2-4 Ratti

Anupāna : *Māmsyadikwātha*

Therapeutic Uses

Hysteria

Ārogya Vardhani Guṭī

रसगन्धकलोहाभ्रशुल्बभस्म समांशकम् । त्रिफला द्विगुणा प्रोक्ता त्रिगुणं च शिलाजतु ।।
चतुर्गुणं पुरं शुद्धं चित्रमूलं च तत्समम् । तिक्ता सर्वसमा ज्ञेया सर्वं सञ्चूर्ण्य यत्नतः ।।
निम्बवृक्षदलाम्भोभिर्मर्दयेद् द्विदिनावधि । ततश्च वटिका कार्या राजकोलफलोपमा ।।
मण्डलं सेविता सैषा हन्ति कुष्ठान्यशेषतः । वातपित्तकफोद भूताज्वरान्नानाप्रकारजान् ।।
देया पञ्चदिने जाते ज्वरे रोगे वटी शुभा । पाचनी दीपनी पथ्या हृद्या मेदोविनाशिनी ।।
मलशुद्धिकरी नित्यं दुर्धर्षक्षुत्प्रवर्तिनी । बहुनात्र किमुक्तेन सर्वरोगेषु शस्यते ।।
आरोग्यवर्धनी नाम्ना गुटिकेयं प्रकीर्तिता । सर्वरोगप्रशमनी श्रीनागार्जुनयोगिना ।।

(रसरत्नसमुच्चय-कुष्ठे)

Apparatus required

Khalva yantra, cloth, vessel etc.

Drugs required

Śuddha pārada	:	*1 part*
Śuddha gandhaka	:	*1 part*
Loha bhasma	:	*1 part*
Abhraka bhasma	:	*1 part*
Tāmra bhasma	:	*1 part*
Triphala cūrṇa	:	*2 part*
Śuddha śilājitu	:	*3 part*
Śuddha guggulu	:	*4 part*
Citramūla cūrṇa	:	*1 part*
Kaṭukī cūrṇa	:	*18 parts*
Nimba patrta swarasa or		
Nimba pañcānga kaṣāya	:	Apropriate quantity.

Procedure

First up all *kajjali* is prepared with *śuddha pārada* and *suddha gandhaka* in a *khalva yantra*, then rest of the drugs(no.3 to 10) are added and grinded well for uniform mixing, then appropriate quantity of *nimba patra swarasa* or *nimba pañcamūla kwātha* are added and *bhāvana* is done for two days.then

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contents are made in to pill form which are equal is size to (*rāja kola*) big size *badara phala*, (But usually *ārogya vardhini guṭikas* are prepared having weight of 3 *ratti* only) and dried in shade (*chāya suṣka*), then preserved in glass container.

Therapeutic Uses

Maṇḍala kuṣṭa, all varieties of *kuṣṭa, vātika jwara, pittaja jwara, sleṣmaja jwara, dwandwaja and sannipātika jwara.*

Mode of administration

In the case of *jwara* after five days of occurence *ārogya vardhini vaṭi* administration should be started.

Karma

Pācanam, dipanam, hṛdyam, medohara, *malaśodhanam*. By changing *anupāna* this *ārogya vardhini vaṭi* can be administered for the treatment of all the diseases. This recipe is called *ārogya vardhini guṭika* and it is mentioned by *rasa siddha nāgaruna* as a medicine to cure all the diseases.

Arśogni Vaṭi

(सिद्धयोग संग्रह, अर्शोधिकार)

Ingredients

1. *Nimba Phala* - *143 gm*
2. *Mahanimba* - *143 gm*
3. *Khūnakharaba* - *143 gm*
4. *Triṇakānta Piṣṭi* - *143 gm*
5. *Dāruharidra* - *429 gm*

Dose : 125 – 500 mg.

Anupāna : Water.

Therapeutic Uses

Raktārśa, Suṣkarśa.

Citrakādi Vaṭī

चित्रकं पिप्पलीमूलं द्वौ क्षारौ लवणानि च। व्योषहिंग्वजमोदाच्च चव्यं चैकत्र चूर्णयेत्।।
गुटिका मातुलुङ्गस्य दाडिमस्य रसेन वा। कृता विपाचयत्यामं दीपयत्याशु चानलम्।।

(चक्रदत्त-ग्रहणी ९)

Apparatus required

Khalvayantra , cloth, vessel,tray, etc.

Drugs required

Citrakamūla cūrṇa	:	*1 part*
Pippalīmūla cūrṇa	:	*1 part*
Yavakṣāra	:	*1 part*
Sarja kṣāra	:	*1 part*

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Saiṇdhava lavaṇa	:	*1 part*
Sourchala lavaṇa	:	*1 part*
Sāmudra lavaṇa	:	*1 part*
Viḍa lavaṇa	:	*1 part*
Oudbhida lavaṇa	:	*1 part*
Śuṇṭhi cūrṇa	:	*1 part*
Pippali cūrṇa	:	*1 part*
Marīca cūrṇa	:	*1 part*
Suddha hingu	:	*1 part*
Ajamoḍa cūrṇa	:	*1 part*
Cavyamula cūrṇa	:	*1 part*
Mātulunganimbu Swarasa or dāḍima phalaswarasa.	:	*Appropriate quantity*

Procedure

All above mentioned drugs (no.-1to 15) are made into fine powder form and collected in to vessel and *mātulunga nimbu swarasa* or *dāḍima phala swarasa* in appropriate quantity is added and substance is converted in to paste form and taken in to *khalva yantra* and grinded well then it is dried , like that same (bhāvana) process is done for total 3 times. Then this is moulded in to gutika form, having the weight of 6 *rattis* to12 *rattis* and dried in shade, then preserved in air tight glass containers.

Karma : *Āma pācanam, agnidīpana,*

Therapeutic Uses

Grahaṇi, agnimandhya etc.

Mātra : 6 *rattis*

Anupāna : *Takra, uṣnodaka.*

Candraprabha Vaṭi

चन्द्रप्रभा वचा मुस्तं भूनिम्बामृतदारूकम। हरिद्रातिविषा दार्वी पिप्पली मूलचित्रकौ।।
धान्यकं त्रिफला चव्यं विडंगं गजपिप्पली। व्योषं माक्षिकधातुश्च द्रवौ क्षारौ लवणत्रयम्।।
एतानि शाणमात्राणि प्रत्येकं कारयेद्बुधः। त्रिवृददन्ती पत्रकं च त्वगेला वंशरोचना।।
प्रत्येकं कर्षमात्राणि च कुर्यदितानि बुद्धिमान्। द्विकर्ष हतलोहं स्याच्चतुष्कर्षा सिता भवेत्।।
शिलाजत्वष्टकर्ष स्यादष्टौ कर्षास्तु गुग्गुलोः। एभिरेकत्र संक्षुण्णैः कर्तव्या गुटिका शुभा।।

(शा. ध. सं. मध्यमखण्ड, ७/४०-४४)

Apparatus Required : *Loha Pātra,* stainless steel vessel, stirrer, *Khalva yantra,* cloth.

Drugs Required:

1. *Kacūra*	2. *Vaca*	3. *Musta*	4. *Bhūnimba*
5. *Devadāru*	6. *Haridra*	7. *Ativiṣa*	8. *Dāruharidra*
9. *Pippalīmūla*	10. *Trivṛtmūla*	11. *Dantīmūla*	12. *Tejapatra*
13. *Dalcini*	14. *Sūkṣma ela*	15. *Vaṁśalocana*	16. *Dhānyaka*

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17. Āmlakī	*18. Harītakī*	*19. Vibhitakī*	*20. Cavyamūla*
21. Viḍanga	*22. Gajapippalī*	*23. Suṇthi*	*24. Pippali*
25. Marīca	*26. Yavakṣāra*	*27. Sarjikakṣāra*	*28. Saindhava lavaṇa*
29. Sourcalavaṇa	*30. Viḍalavaṇa*	*31. Śodhita guggulu*	*32. Loha bhasma*
33. Sugar	*34. Śodhita śilajatu*	*35. Śwarnamākṣika bhasama*	

Procedure

Above mentioned drugs No. 1 to 30 all should be prepared into fine powder form (*Vastra Gālitha*) and kept ready. *Śodhita guggulu* mixed with appropriate quantity of water and heated over *mandāgni*, while heating continuosly stirred, to facilitate uniform distribution of *guggulu* in water. Then *śodhita śilājath* is added and mixed well, thereafter powdered sugar is added and mixed well. Then fine powder of above mentioned drugs No. 1 to 30 and loha *bhasma, swarnamākṣika bhasma* also added and mixed uniformely. Then vesel is taken out from fire and contents are collected into *Khalva yantra* and triturated well for making soft mass (if necessary little bit hot water also can be added while triturating to get proper consistency). Then this material is moulded into *vaṭi* form having the weight of 3 *ratti* and dried in shade (*cāya suṣka*) .This recipe known as *candraprabhāvaṭī*. It should be preserved in air tight glass containers.

Karma : *Balya, Vrsya , Rasāyana.*

Therapeutic Uses

Sarva rogaharan, 20 types of *Prameha*, 8 types of *mūtrakṛcra*, 4 types of *aśmari*, 13 types of *mūtrāghāta anḍavṛddi, Pāṇḍu, Kāmalā, Halīmaka, Kāsa, Śwāsa, Kuṣṭha, Agnimāndhya, Aruci, Vāta, Pitta* and *kapha vikāra*.

Dose : 1 *Vaṭi* to 4 *Vaṭi*

Anupāna : Hot milk, water.

Eladi Vaṭi

एलापत्रत्वचोऽर्द्धाक्षाः पिप्पल्यर्द्धपलं तथा । सितामधुकखर्जूरमृद्वीकाश्च पलोन्मिताः ।।
सञ्चूर्ण्य मधुना युक्ता गुटिकाः कारयेद्भिषक् । अक्षमात्रां ततश्चैकां भक्षयेच्च दिने दिने ।।
कासं श्वासं ज्वरं हिक्कां छर्दिं मूर्च्छां मदं भ्रमम् । रक्तनिष्ठीवनं तृष्णां पार्श्वशूलमरोचकम् ।।
शोषप्लीहामवातांश्च स्वरभेदं क्षतक्षयम् । गुटिका तर्पणी वृष्या रक्तपित्तं विनाशयेत ।।

(भै. र. रक्तपित्ते)

Apparatus required

Khalva yantra, cloth, vessel, tray etc.

Drugs required

Sūkṣma ela	:	$^1/_2$*pala*
Teja patra	:	$^1/_2$*pala*
Dālchini(twak)	:	$^1/_2$*pala*
Pippali	:	$^1/_2$*pala*
Sita(sugarcandy)	:	*1 pala*
Yastimadhu	:	*1 pala*

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Piṇḍakharjura (Seedless) : *1 pala*
Drākṣa : *1 pala*
Madhu : *1 pala*

Procedure

Ela to *yaṣtimadhu* all six drugs are made in to fine powder form and kept ready. Seedless *piṇḍa kharjūra* and seedless *drakṣa* are grinded in *khalva yantra*, then rest of the drugs powder is added to them grined and mixed uniformely, *madhu* is added and again mixed well.

Then contents are made in to *guṭīka* having weight about 1 *tola* and dried in sun light and preserved, air tight glass containers. This *guṭikā* is advised to prepare in summer season.

Karma : *Tarpana, vṛṣya*

Therapeutic Uses

Kāsa, swāsa, jwara, hikka, chardi, mūrcha, mada, bhrama, raktapitta, tṛṣna, pārswaśūla, aruci, śosa, plīhavṛddi, āmavāta, śwarabheda., urah kṣata, kṣaya.

Mātra : 1 tola , two times per day.

Kānkāyan Guṭika

शटी पुष्करमूलन्चदन्ती चित्रकमाढकीम् । श्रृगंवेरं वचान्चैव पलिकानि समाहरेत् ।।
त्रिवृतायाः पलन्चैकं कुर्यात् त्रीणि च हिंगुनः । यवक्षारपले द्वेतुद्वेपले चाम्लवेतसात् ।।
यामांयजाजो मरिचं धान्यकन्चेति कार्षिकम् । उपकुन्चयजमोदाभ्यां तथाचाष्टमिकामपि ।।
मातुलुंगरसे चैता गुडिकाः कारयेद्भिषक् । (भै. र. गुल्माधिकार; ५६-५८, १/२)

Ingredients

1. *Śaṭhi* - *624 gm*
2. *Puṣkaramūla* - *624 gm*
3. *Danti* - *624 gm*
4. *Citrak* - *624 gm*
5. *Adhaki* - *624 gm*
6. *Sṛngavera* - *624 gm*
7. *Vaca* - *624 gm*
8. *Trivṛt* - *624 gm*
9. *Hingu* - *1872 gm*
10. *Yavakṣāra* - *1248 gm*
11. *Āmlavetas* - *1248 gm*
12. *Yamāni* - *156 gm*
13. *Jiraka* - *156 gm*
14. *Marica* - *156 gm*
15. *Dhānyaka* - *156 gm*
16. *Kṛṣṇajiraka* - *312 gm*
17. *Ajamoda* - *312 gm*

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18. Mātulungarasa - q.s

Dose : 2gm

Anupāna : *Ghṛt, Milk, Water, Madhya*

Therapeutic Uses

Gulma, Kṛmi, Arśa, Raktapitta, Hṛdayaroga

Khadirādi Guṭika

खादिर पौष्करं श्रृंगो कट्फलं द्विजयष्टिका। हरीतकी लवंगं च ब्योषं चातिविषं तथा।।
कारवी यासममृता बृहतीद्वयमक्षकम्। पृथक्कर्षद्वयं ग्राहयं सूक्ष्मचूर्ण तु कारयेत्।।
सर्वे: समं खादिरं च मेलयित्वा विभावयेत्। दाडिमत्वक्तथा क्षुद्राखदिरम्भोभिराद्रकै:।।
बब्बूलत्वग्दल क्वाथैराटरूषजलै स्तथा। सप्तधा भावयेद् बद्ध्वा गुटिका खादिरी मता।।

(योगरत्नाकर, कासचिकित्सा पृ. ३५३-३५४)

Ingredients

1.	*Khadirasāra*	-	*313 gm*
2.	*Puṣkaramūla*	-	*313 gm*
3.	*Karkaṭaśringi*	-	*313 gm*
4.	*Kaṭphala*	-	*313 gm*
5.	*Bhārangi*	-	*313 gm*
6.	*Haritaki*	-	*313 gm*
7.	*Lavanga*	-	*313 gm*
8.	*Śuṇṭhi*	-	*313 gm*
9.	*Marica*	-	*313 gm*
10.	*Pippali*	-	*313 gm*
11.	*Ativiṣa*	-	*313 gm*
12.	*Kṛṣṇajiraka*	-	*313 gm*
13.	*Yavakṣāra*	-	*313 gm*
14.	*Guḍūci*	-	*313 gm*
15.	*Bṛhati*	-	*313 gm*
16.	*Kaṇṭakāri*	-	*313 gm*
17.	*Vibhitaki*	-	*313 gm*
18.	*Kadhira*	-	*4695 gm*
19.	*Dāḍima twak*	-	*q.s.*
20.	*Kaṇṭakāri*	-	*q.s.*
21.	*Khadira Kwāth*	-	*q.s.*
22.	*Ārdrak Swaras*	-	*q.s.*
23.	*Babbula Swaras*	-	*q.s.*
24.	*Babbula Kwāth*	-	*q.s.*
25.	*Vāsa Swaras*	-	*q.s.*

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26. Babbulpatra Kwāth - q.s.

Dose : 1gm

Anupāna : Madhu

Therapeutic uses

Kāsa, Śwāsa

Lasunādi Vaṭi

लशुना-जीरक सैन्धव गन्धक -त्रिकटु-रामठ-चूर्ण मिदं समम् ।
सपदिनिम्बुरसेन विषूचिकां हरति भोरतिभोगविचक्षणे । (वै.जी. क्षयरोगाचिकित्सा १३)

Ingredients

1. Lasuna - 50 gm
2. Jiraka - 50 gm
3. Saindhava - 50 gm
4. Gandhaka - 50 gm
5. Śuṇṭhi - 50 gm
6. Maricā - 50 gm
7. Pippali - 50 gm
8. Hingu - 50 gm
9. Nimbu Swarasa - q.s.

Dose : 1gm

Anupāna : Warm Water

Therapeutic uses

Visūcika, Ajirṇa, Atisāra.

Lavangādi Vaṭi

तुल्यालवङ्गमरिचाक्षफलत्वचः स्युः सर्वैः समो निगदितः खदिरस्य सारः ।
बब्बूलवृक्षजकषाययुतञ्च चूर्णं कासान्निहन्ति गुटिका घटिकाऽष्टकान्ते ।। (वैद्यकजीवन ३ विलास)

Apparatus required

Khalvayantra, cloth, vessel, tray.

Drugs required

Lavanga cūrṇa : 1 part
Marīca cūrṇa : 1 part
Vibhītakaphala cūrṇa : 1 part
Khadhira kāṣṭa sāra cūrṇa : 3 part
Babbula twak kwātha cūrṇa : Appropriate quantity.

Procedure

All drugs (*Lavanga, marīca,vibhītaki, khadhira sāra*) are made in to fine popwder form and taken in to a *khalva yantra* and *babbula twak kwātha* sufficient quantity is added and 3 *bhāvanas* are done, then this substance is made into pill form having the weight of 3 to 4 *ratti*, and dried in shade. This

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recipe is called *lavangādivaṭi* and preserved in glass containers.

Mode of administration

It is advised to chew by keeping in mouth.

Therapeutic Uses

Kāsa etc.

Prabhākara Vaṭi

माक्षिकं लोहमभ्रन्च तुगाक्षीरी शिलाजतु । क्षिप्त्वा खल्लोदरे पश्चात् भावयेत् पार्थवारिणा ।।

(भै. र. हृद्रोगाधिकार; ६६)

Ingredients

1. *Swarṇa Mākṣika Bhasma- 21 gm*
2. *Lauha bhasma - 21 gm*
3. *Abhraka bhasma - 21 gm*
4. *Tugākṣiri - 21 gm*
5. *Śilājatu - 21 gm*
6. *Arjuna Twak Kwātha - Bhāvana*

Dose : 125 to 250mg

Anupāna : *Water, Arjuna Kwātha, Milk.*

Therapeutic Uses

Hṛdroga.

Rasonādi Vaṭī

लशुनजीरकगन्धकसैन्धवं त्रिकटुरामठचूर्णमिदं समम् । सपदि निम्बुरसेन विसूचिकां हरति भो रतिभोगविचक्षणे ।।

(वैद्यजीवन-विसूचिका)

Apparatus required

Khalvayantra, vessel, tray, etc.

Drugs required

Lasuna (external	:	*1 part*
Covering is removed)	:	
Swetajīraka	:	*1 part*
Śodhita gandhaka	:	*1 part*
Saiṇdhavalavaṇa	:	*1 part*
Śuṇṭhi	:	*1 part*
Pippali	:	*1 part*
Marīca	:	*1 part*
Śodhita hingu	:	*1 part*
Nimbu swarasa	:	*Appropriate quantity*

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Procedure

First up all external covering of the *lasuna* is removed and it is taken in to *khalva yantra* and grinded well, kept-ready then *jīraka* to *marīca* (no.-2to7) total 6 drugs are made in to fine powder form and kept ready. *Śodhita hingu* is to be mixed in appropriate quantity of *nimbuswarasa* and mixed well. Then *lasuna kalka, dravya sūkṣma cūrṇa*, and *nimbu swarasa* with hingu all are mixed together and grinded well in *khalvayantra*. Then this substance is made in to *guṭikā* having the weight of 4 rattis and dried in shade after that again it has to be dried in sun light for some time. This recipe is called *rasonādi vaṭi* and it preserved in glass containers.

Therapeutic Uses

Visūcika, ajīrna, ādhmāna, udaravikāra,

Mātra : 2 to 4 gutika

Anupāna : *Uṣnodaka*

Rajahpravardhini Vaṭi

कन्यासार च काशीस रामठं टंकणं तथा। समादाय समं सर्व पेषयेत्कन्यकाद्रवै।

(भै. र. स्त्रीरोगाधिकार २३३)

Ingredients

1. *Musabbar* - *50 gm*
2. *Kāsisa* - *50 gm*
3. *Hingu* - *50 gm*
4. *Tankaṇa* - *50 gm*
5. *Ghṛtakumāri Swaras* - *q.s.*

Dose : 250 mg

Anupāna : *Lukewarm Water, Tilakaṣāya, Kuluthakaṣāya*

Therapeutic uses

Rajorodh, Kaṣṭārthav

Śivaguṭika

कौटजत्रिफला निम्वपटोलधननागरैः। भावितानि दशाहानि रसैर्दिवत्रिगुणानि च।।
शिलाजतुपलान्यष्टौ तावती सितशर्करा। त्वक्क्षीरी पिप्पली धात्री कर्कटाख्यान्पलोन्मितान्।।
निदिग्धफलमूलाभ्यां पलं युन्ज्यात्रिजातकात्। मधुत्रिफलसंयुक्ताकुर्यादक्ष-समान्गुडान्।।
दाडिमामापयः क्षीररसयू षसुरासवान्। तं भक्षयित्वाऽनुपिनेत्रिरन्नौ हितभक्ष्यभुक्।।
यद्यत्र योजतं येन कान्तलोहं तथाऽभ्रकम्। पलं पलं चमिलिते तदा सयात्किमतः परम्।।

(योगरत्नाकर, राजयक्ष्मचिकित्सा १-४ और ६ पृ. ३२२)

1. *Śilajit* - *2672 gm*
2. *Sita* - *2672 gm*
3. *Vaṁsalocana* - *334 gm*
4. *Pippali* - *334 gm*
5. *Āmalaki* - *334 gm*

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6. *Karkaṭaśringi* - *334 gm*
7. *Kaṇṭakāri* - *334 gm*
8. Ela - 334 gm
9. Tejapatra - 334 gm
10. Drākṣa - 334 gm
11. Karjūr - 334 gm
12. Gambhāri - 334 gm
13. Kāntaloha bhasma - 334 gm
14. Abhraka bhasma - 334 gm

Dose : 6 *Māṣa*

Anupāna : *Madhu,Triphala Kwātha*

Therapeutic Uses

Pāṇḍu, Kuṣṭa, Jwara, Tamaka Śwāsa, Arśa, Bhagandara, Mūtrakṛcra, Rājayakṣma.

Saubhāgya Vaṭi

सौभाग्यामृतजोरपञ्चलवणव्योषाभयाक्षामला । निश्चन्द्रभ्रकशुद्धगन्धकरसानेकीकुतान् भावयेत् ।।
निर्गुण्डीयगभृं गराजकवृषापामार्गपत्रोल्लसत् । प्रत्येकस्वरसेन सिद्धवटिका हन्ति त्रिदोशोद्वयम् ।।
(भै. र. ज्वराधिकार ४७४.१)

Ingredients

1. *Saubhāgya* - *50 gm*
2. *Amṛta* - *50 gm*
3. *Jiraka* - *50 gm*
4. *Saurcalalavaṇa* - *50 gm*
5. *Saindhavalavaṇa* - *50 gm*
6. *Viḍalavaṇa* - *50 gm*
7. *Samudralavaṇa* - *50 gm*
8. *Audbidalavaṇa* - *50 gm*
9. *Śuṇṭhi* - *50 gm*
10. *Marica* - *50 gm*
11. *Pippali* - *50 gm*
12. *Haritaki* - *50 gm*
13. *Vibhitaki* - *50 gm*
14. *Āmalaki* - *50 gm*
15. *Abhrakabhasma* - *50 gm*
16. *Śuddha Gandhak* - *50 gm*
17. *Rasa (Pārada)* - *50 gm*
18. *Śwetanirguṇḍirasa* - *q.s.*
19. *Nilanirguṇḍirasa* - *q.s.*

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20. *Bhṛngarājarasa* - *q.s*
21. *Vāsaswarasa* - *q.s*
22. Apamārgapatra Swarasa - q.s

Dose : 250 mg

Anupāna : *Ārdrakarasa, Warm Water.*

Therapeuticuses

Sannipātajwara, Śwāsa, Kāsa, Viṣamajwara, Mūrchha, Aruci, Jwara.

Śankavaṭi

चिन्चाक्षारपलंपटु वज्रपलंनिम्बूरसेकल्कितम् । तस्मिन् शंखपलं प्रतप्तसकृत् संस्थाप्य शीर्णावधि ।।
हिंगुव्योषपलं रसामृतवली निक्षिप्य निष्कांशिका: । (भै. र. अग्निमान्द्यादिरोगाधिकार; १८२, १/२)

Ingredients

1. *Cincha kṣāra* - *48 gm*
2. *Pañca lavaṇa* - *48 gm*
3. *Nimbu swarasa* - *Q.S.*
4. *Śankha bhasma* - *48 gm*
5. *Hingu* - *48 gm*
6. *Śuṇṭhi* - *48 gm*
7. *Marica* - *48 gm*
8. *Pippali* - *48 gm*
9. *Rasa* - *3 gm*
10. *Vatsanābha* - *3 gm*
11. *Gandhaka* - *3 gm*

Dose : 250 to 500 mg

Anupāna : Honey, warm water, butter milk.

Therapeutic uses

Agnimāndhya, Grahaṇi, Arocaka, Paktiśūla.

Sanjīvanī Vaṭī

विडङ्गं नागरं कृष्णा पथ्यामलबिभीतकम् ।।
वचा गुडूची भल्लातं सद्विषं चात्र योजयेत् । एतानि समभागानि गोमूत्रेणैव पेषयेत् ।।
गुञ्जाभा गुटिका कार्या दद्यादार्द्रकजै रसैः । एकामजीर्णगुल्मेषु द्वे विसूच्यां प्रदापयेत् ।।
त्रिस्त्रश्च सर्पदष्टे तु चतस्रः सान्निपातिके । वटी संजीवनी नाम्ना संजीवयति मानवम् ।।
(शा० सं० म० ख० ७.१८-२१)

This recipe known as sanjivani vati because it brings a dying man back to life.

Apparatus required

Khalva yantra, cloth tray, glass jars. Etc.

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Drugs required

Viḍaṇga	: *1 part*
Nāgar	: *1 part*
Pippalī	: *1 part*
Harītaki	: *1 part*
Āmalaki	: *1 part*
Vacha	: *1 part*
Guḍūci	: *1 part*
Śodhita bhallataka	: *1 part*
Śodhita vatsanābha	: *1 part*
Gomūtra (Cow)	: *Appropriate quantity*

Procedure

Above mentioned 10 drugs are made in to fine powder form separately and taken in equal quantity, then all together mixed in a *khalvayantra* and added sufficient quantity of *gomūtra* and *bhāvana* is done, till contents reaches the *mātrapāka* state of vaṭi. Then contents are rolled in to pill form having the size of *guñja* (125mg.) and these are dried in shade (*chāyaśuṣka*).

Mātra : 1 *Guñja* to 4 *Guñja*.

Anupāna : *Ārdraka swarasa* (*tulasi swarasa* also papular *anupāna* for *sanjīvinivaṭī*)

Therapeutic Uses

Ajīrna, gulma, viśūci, snake bite, *sannipātajwara*. According to the disease, the dos of *sanjīvanivaṭī* is mentioned like wise.

One pill (2-3 times per day) - *Ajīrna* and gulma

Two pills (4 times per day) - *Ciśūci*

Three pills (2 times per day) - *Snake bite*

Four pills (2-3 times per day) - *Aannipāta jwara*

Śūlavarjini Vaṭika

रसगन्धकलौहानां पलार्धेन समन्वितम्। त्रिफला रामठंशुल्वं शटी त्रिकटु टंकणम्।।
पत्रं त्वगेला तालीश जातीफललवंगकम्। यमानी जीरकं धान्यम् प्रत्येकं तालर्क मतम्।।
माषैका वटिका कार्य्या छागीदुग्धेन वा पुनः। (रसेन्द्रसारसंग्रह; शूलरोगचिकित्सा; ४६-४७ १/२)

Ingredients

1. *Rasa (Pārada)* - *816 gm*
2. *Gandhaka* - *816 gm*
3. *Lauha bhasma* - *816 gm*
4. *Haritaki* - *408 gm*
5. *Vibhitaki* - *408 gm*
6. *Āmalaki* - *408 gm*
7. *Hingu* - *408 gm*

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8. *Tāmra bhasma* - *408 gm*
9. *Ṣaṭhi* - *408 gm*
10. *Śuṇṭhi* - *408 gm*
11. *Marica* - *408 gm*
12. *Pippali* - *408 gm*
13. *Tankaṇa* - *408 gm*
14. *Tejapatra* - *408 gm*
15. *Twak* - *408 gm*
16. *Ela* - *408 gm*
17. *Tālisa patra* - *408 gm*
18. *Jātiphala* - *408 gm*
19. *Lavanga* - *408 gm*
20. *Yamāni* - *408 gm*
21. *Jiraka* - *408 gm*
22. *Dhānya* - *408 gm*
23. *Ajādugdha* - *q.s*

Dose : 25mg

Anupāna : Warm water

Therapeutic Uses

Śūlaroga, Pliharoga, Gulma, Udara, Āmlapitta, Pāṇḍu, Kāmala, Śotha, Mandāgni, Ślipada.

Vyoṣādi Guṭikā

व्योषाम्लवेतसं चव्यं तालीसं चित्रकं तथा। जीरकं तिन्तिडीकं च प्रत्येकं कर्षभागिकम्।।
त्रिसुगन्धं त्रिशाणं स्याद् गुडः स्यात्कर्षविंशतिः। व्योषादिगुटिका सेयं पीनसश्वासकासजित्।।
रुचिस्वरकरी ख्याता प्रतिश्यायप्रणाशिनी। (शा० सं० म० ख० ७.२२-२४)

Apparatus required

Khalva yantra, wide mouthed vessel, tray, cloth etc.

Drugs required

Vyoṣa (śuṇṭi) : *1 karṣa*
Āmlavetasa : *1 karṣa*
Cavyam : *1 karṣa*
Tālisa patra : *1 karṣa*
Citramūla : *1 karṣa*
Jīraka : *1 karṣa*
Tintiḍīka : *1 karṣa*
Trisugaṇdhas (ela,twak,patra) : *3 Ṣāṇas*
Guḍa : *20 karṣa*
Water : *Appropriate quantity*

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Procedure

All above mentioned drugs are made in to fine powder form and kept ready for mixing in ***pāka***. *Guḍa* is made in to pieces and mixed with appropriate quantity of water, in a vessel and heated over *mṛdu agni*, when *guḍa* gets dissolved completely in water, then contents are filtered with cloth, this filtered liquid is again heated till it reaches proper *pāka*. Then vessel is taken out from fire and above mentioned drugs (from *vyoṣa* to *tintiḍīka*) in fine powder form, in respected quantity, mixed in *pāka* uniformely, then *sugandhita dravya* (*ela, twak, patra*) powder also added and mixed uniformely. Then this substance is made into *vaṭīka*, having the weight of 6 gms and dried in shade then preserved in air tight glass or plastic containers. This recipe known as *vyoṣādi guṭikā*.

Mātra : 6 gms.

Karma : *Rucikaram, Swarahitakaram*

Therapeutic Uses

Pīnasa, kāsa, śwāsa, pratiśyāya.

Mode of administration

It is advised to chewe by keeping in mouth , 4 *vaṭis* per day.

Modern Aspect of Vaṭi (Tablet)

Of all the routes of administration, probably the most important and popular one is the oral route. The drug are administered orally usually for systemic effect, but the route may also be used for local action in the gastrointestinal tract. The parenteral route of administration is not routinely used for self-medication and the topical route of drug administration has only been recently employed to deliver drugs to the body ofr systemic effects . The parenteral route of administration is important in treating medical emergencies. Approximately 90% of all drugs used to produce systemic effects are administered by the oral route. Out of the drugs that are administered orally, solid oral dosage forms represent the preferred class of product. The reasons for solid oral doses are:

1. Solid oral dosage forms, such as tablets or capsules, represent unit dosage forms in which a single dose of the drug is accurately placed.

2. Liquid oral dosage forms such as syrups, solutions, suspensions, emulsion and elixirs usually contain many doses of the product; and the patient is asked to measure his or her own dose using a teaspoon, tablespoon, etc. There might be an error in measurement.

3. Liquid oral dosage forms are more costly to transport because of the weight is greater and leakage or breakage during shipment is a serious problem.

4. Masking the taste or odour of the drug is often a problem, in the case of liquid dosage forms.

5. Liquid oral dosage forms are less portable and require much more space for storage.

6. Drugs formulated in liquid form are generally less stabel than in the dry state and therefore the expiry dates are shorter i.e. shelf life is shorter.

7. There is usually a more microbiologic burden and more contamination in a liquid dosage form than in solids, under normal conditions of use.

8. Tablets and capsules form the two popular oral solid dosage forms :

Definition of tablets

Tablets may be defined as solid pharmaceutical dosage forms containing drug substances, with or

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without suitable diluents, and prepared either by compression or molding method. Indian pharmacopoeia defines compressed tablets as follows "Pharmaceutical tablets are solid, flat or biconvex discs prepared by compressing a drug or a mixture of drugs with or without suitable diluents. They vary in shape and differ greatly in size and weight, depending on the amount of medicinal substances and the intended mode of administration''.

Tablets have been in widespread use since the latter part of 19th century and their popularity is growing. Tablets remain popular as a dosage form because of the advantages offered by this dosage form to the manufacturer and the patient.

Advantages of tablets

1. Tablet is essentially a tamper proof dosage form; therefore there are no changes of adulteration or mixing.
2. There is accuracy of dosage. They are unit dosage forms and offer the greatest dose precision and the least content variability compared to other oral and topical dosage forms.
3. The cost of tablets is lowest of all oral dosage forms .
4. They are usually the lightest and most compact of all oral dosage forms.
5. They are usually the cheapest to package and ship (Economy).
6. Product indentification is very important and in the case of tablets, this is the simplest and cheapest. This can be done by employing embossed or monogrammed punches.
7. They provide the greatest case of swallowing.
8. It is possible to prepare certain special types of products, such as enteric coated (which disintegrate only in small intestine) or delayed release tablets.
9. Tablets are better suited for large scale production than other unit oral dosage forms.
10. Tablets offer great ease of administration, as compared to other dosage forms.
11. There is a diversity of use of tablets.

Although the basic mechanical approach to their manufacture has remained the same, tablet technology has undergone great improvement. Although tablets are usually disc- like in shape, they also may be round, oval, cylindrical, triangular, pillow- shaped, oblong, capsule shaped (caplet). Tablets are divided into two general classed depending upon whether they are made by compression or muolding. Compressed tablets are usually prepared by large- scale production methods, while moulded tablets are prepared by small scale methods.

Disadvantage of tablets

1. Some durgs cannot be compressed into dense compacts, because of the amorphous nature of the drug or because of its low density.
2. Drugs with poor wetting, slow dissolution properties, or large dosage are difficult or impossible to formulate and manufacture as a tablet.
3. Bitter-tasting drugs, or those with objectionable odour or drugs which are sensitive to moisture or oxygen, may require encapsulation before compression, or the tablets may require a coating.

Types of tablets

Tablets may be classified according to their route of administration or function. Depending on the

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route of administration , tablets may be classified as follows :

1.Oral tablets

These may be further classified into:

a) Compressed tablets

b) Multiple compressed tablets

(I)Layered tablets (II) Compression coated tablets

c) Repeat action tablets.

d) Delayed action tablets.

e) Enteric coated tablets.

f) Sugar coated tablets.

g) Film coated tablets.

h) Chewable tablets

i) Controlled – release tablets.

II) Tablets for oral cavity

These include four types of tablets:

a) Buccal tablets

b) Sublingual tablets

c) Lozenges

d) Dental cones

III) Tablets administered by other routes

They are further classified into:

a) Implants

b) Vaginal tablets

IV) Tablets for solutions

They are further subdivided into

a) Effervescent tablets

b) Dispensing tablets

c) Hypodermic tablets

d) Tablet triturates.

I. Oral Tablets

(a) *Compressed tablets :* This category includes standard, uncoated tablets made by compression and employing any of three basic methods of manufacture.

(i) Wet granulation

(ii) Double compaction

(iii) Direct compression

Tablets in this category are usually intended for providing rapid disintegration and drug release. Tablets for local effect in the gastrointestinal tract are also indcluded in this category. Such tablets , for local effect, include drugs like antacids and adsorbents. Other drugs in this group are intended to pro-

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duce a systemic effect. These durgs have some solubility in water. The tablet should disintegrate into small fragments and particles, in order to release the drug. Dissolution of the tablet is also another important phenomenon, and it depends on surface area. If the surface area is greater, the rate of dissolution is higher.

(b) *Multiple compressed tablets :* In this group are included two classess:

(i) Layered tablets

(ii) Compression coated tablets

Both these types of tablets may contain either two components or three components. Production speeds for multiple compressed tablets are much slower than that for standard compressed tablets. Multiple compressed tablets are prepared usually for two reasons, viz., to separate, physically or chemically, incompatible ingredients, or to produce repeat action tablet. The layered tablet is preferred to the compression –coated tablet because the surface contact between the layers is less. So, producion also become simpler and more rapid. It is possible to prepare repeat-action tablets easily from multiple compressed tablets. Here, the outer layer provides the initial dose of the drug and the subsequent layer or layers provide the repeat dose or maintenance dose of the drug.

(c) *Repeat action-tablets :* these types of tablets firstly provide the initial dose from the outer layer or outermost coating, and then the maintenance dose is released from the lower layers or core of the tablet. The core of the tablet is usually coated with shellac or some other polymer, so that it will not release its contents immediately into the stomach.The second dose of the drug is then added in the sugar coating: which is an immediate release component of the drug.

(d) Delayed action and (e) *Enteric coated tablets* : As the name indicates, the delayed action tablet dosage form is intended to release a drug after some time delay. The enteric coated tablet is a good example of a Delayed Action Tablet. Enteric coated tablet remains intact in the stomach, but quickly releases the drug in the upper intestine. Cellulose acetate phthalate is extensively used as an enteric coating material for tablets. More recently, poly vinyl acetate phthalate and hydroxy propyl methyl cellulose phthalate have also been used as enteric materials. Enteric coating are used for a number of reasons. Some drugs are irritating in the stomach. Such drugs should be released intestine, and not in the stomach, e.g. aspirin . Enteric coating thus reduces irritation in the stomach. Sometimes, the low pH of the stomach destroys certain drugs e.g. erythromycin. In these cases an entericcoating may be necessary. At times, it may be necessary to release the drug in an undiluted form in the intestine only, e.g. intestinal antiseptics.

(f) *Sugar coated tablets* : sugar coated tablets are mistaken by children for candy. They types of tablets permit the separation of incompatible ingredients, between coating and core. This fact is used in making multi- vitamin tablets. To day's sugar coating makes use of not only sugar syrups, but also of water soluble polymers. Automatic sugar coating equipment's are utilized in order to increase efficiency. Sugar coated tablets offer obvious advantages, such as coating bitter or obnoxious ingredients and protection from moisture, gases, vapours and light.

(g) *Film coated tablets* : In film coated tablet, a thin film or layer of polymeric material is applied on the tablet surface. Film coating has several advantages. Film coating has better mechanical strength than sugar coating. It also has elasticity and flexibility due to the polymer coating. Film coats may be transparent, embossed or engraved. Film coating also offers protection from environmental conditions such as moisture, gases, vapours and fluctuations in temperature. Film coated tablets can be made enteric by using specific polymers, which will not dissolve in the stomach but release the drug only in the intestine.

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(h) *Chewable tablets* : Chewable tablets are intended to the chewed in the mouth, prior to swallowing. These tablets are not intended to be swallowed intact.The purpose of chewable tablets is to provide medication in a form which can be easily administered to infants, children and elderly patients who may have difficulty in swallowing intact tablets. Bitter tasting drugs can not be formulated in such tablets. Usually, antacid tablets are formulated as chewable tablets. As chewable tablets, antacids offer two distinct advantages. A typical antacid tablet would be difficult to swallow because the dose of the antacid is large; therefore chewable tablets are perferred. Secondly, the activity of antacid is related to particle size. Therefore, better neutralization of acid is possible due to chewing, as chewing greatly reduces the particle size of the antacid drug.

(i) *Controlled release tablets* : These types of tablets offer continuous and consistent release of a drug from the tablet, thereby producing thereapeutically effective and constant concentrations of the drug in the plasma. Thus, it avoids many toxic manifestations and reduces the frequency of administration. In these type of tablets, a drug is embedded in a polymer matrix which releases the drug at a sustained rate, so that the drug is available to the body in proper concentration over an extended period of time.

Manufacture of Tablets

The formulation of tablets has undergone rapid change and development over the last several decades with the advent and emergence of new techniques, methodologies, machineries and control systems. The design of a tablet usually involves a series of compromises, on the part of the formulator (Pharmacist). The correct selection and balance of excipient materials for each active ingredient or combination of ingredients to achieve the desired response is not, in practice, a simple goal to achieve. Tablet formulation and design may be described as the process whereby the formulator insure that the correct amount of the drug, in the right form, is delivered at or over the proper time, at the correct rate and at the desired site of action. Also, the chemical or biochemical integrity of the product must be protected. The amount of drug which is sufficient to produce therapeutic response can be affected by several factors. With most drugs, the efficiency of absorption has been shown to depend on the particle size and the specific surface area of the drug. Therefore, the form in which the drug is absorbed can affect its activity. Most drugs are normally absorbed in solution from the gastro- intestinal tract. Therefore, the rate of solution of the drug becomes the rate limiting step for its absorption. We must also consider the influence of inactive ingredient on the absorption and the pharmacologic response of any tablet system.

It is necessary , therefore, that after administration the solid dosage form such a tablet should break down (disintegrate) into smaller particles, these particles, will than release the drug and the drug will be available in general circulation. The tablet manufacture, therefore, involves the incorporation of other inactive ingreadients along with the active ingredient or drug in the tablet. These inactive ingredients may then be classified, deepending upon their function in the formualtion. These excipients are classified as follows:

1. Diluents
2. Binders and adhesives.
3. Lubricants, antiadherents and glidants.
4. Disintegrants.
5. Colourants

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6. Flavours and sweetners.
7. Miscellanceous components such as buffers and adsorbents.

Diluents

Diluents are the materials which are used to make up the required bulk of the tablet, when the drug quantity itself is not sufficient to produce this bulk. The dose of some drugs is sufficiently high and no diluent is required. Although, diluents are normally thought of as inert ingredients, they can affect the availability of drug in the body. Diluents can also affect the physical properites of the final tablet. Regardless of why a diluent is selected , diluents and all other excipients must meet certain requirements. These are :

(i) They must be nontoxic.
(ii) They must be commercially available in acceptible grades.
(iii) Their cost must be low.
(iv) They must not be contra- indicated e.g. sucrose in the case of diabetic patients.
(v) They must be physiologically inert.
(vi) They must be physically and chemically stable and must be compatible with other ingredients in the formulation.
(vii) They must be free from any hazardous microbial contamination.
(viii) They must be colur- compatible.
(ix) They must not have any deleterious effect on the bioavailability of the drug.
(x) They must not be hygroscopic.

Apart from all these essential attributes, a diluent must possess a sufficient degree of cohesiveness or compressibility.

(a) *Lactose* : Lactose is the most widely used diluent. It is compatible with most drugs; whether it is used in its hydrous form or anhydrous form. The hydrous form is most commonly used in wet granulation methods.Lactose formulations show good drug- release rates, their granules can be readily dried and lactose is a low –cost diluent. Lacotose is extensively used in tablets containing potent drugs such as steroids. Lactose mayshow discoloration in the presence of amine drugs. Lactose anhydrous usually dose not show browning of the tablets containing certain drug as with hydrous lactose. (Maillard reaction). Tablets made from anhydrous lactose show fast disintegration, good friability and practically no sticking, binding and capping. Another form of lactose, known as spray- dried lactose, has improved compressional and good flow properties. Tablets made from spray- dried lactose generally show better physical stability.

(b) *Starch :* Starch, which may come from corn, wheat or potatoes, is used as a tablet diluent. Starch is not only used as a diluent, but also as a disintegrant and binder. Tablets containing high concentrations of starch are often soft, and may be difficult to dry. Now directly compressible starch is also available, and it is a free flowing material, Directly compressible starch is self- lubricating and self –disintegrating. Hydrolyzed starches are also available , which are basically 90 to 92% dextrose and 3 to 5 % Maltose. They are also free flowing and directly compressible starches are compatible with most drugs, but their higher proportion in the tablet formulation should be avoided because the tablets become soft and the moisture content of the tablets increases.

(c) *Mannitol* : Mannitol finds increasing application in to formulation of chewable tablets. Mannitol is perhapes the most expensive sugar used as a diluent. Mannitol gives a cool sensation in the mouth

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because it absorbs heat when it dissolves in the mouth. Mannitol is relatively non- hygroscopic and can be used in vitamin formulations.Tablets containing mannitol usually require fairly high proportions of lubricants as mennitol formulations have poor flow properties.

(d) *Sorbitol* : sorbitol is more water soluble than mannitol Sorbitol is hygroscopic at humidities above 65% . It may be combined with an equal weight of dicalcium phosphate to form a directly comprrssible diluent.

(e) *Sucrose* : Sucrose or sugar and various sucrose- based diluents are employed in tablet making. Sucrose may be used in chewable tablets, along with other diluents. Some manufactures avoid the use of sucrose because it poses difficulty for diabetic patients. Sucrose formulations have a tendency to pick up moisture. Sucrose powder may be used for both, chewable as well as non-chewable tablets.

(f) *Microcrystalline cellulose* : It has wide use in the formulation of directly compressible diluents. The flow properties of this material are good. This is an unique diluent in that , while producing cohesive tablet formulations, the material also acts as a disintegrating agent. It is, however, comparatively expensive material. Microcrystalline cellulose, when used in tablet formulation, shows capillarity and therefore water can penetrate into the tablet, thereby causing rapid disintegration of the tablet. As a diluent, microcrystalline cellulose can be used to control drug release rates when combined with lactose, starch, diabasic calcium phosphate, etc.

(g) *Diabasic calcium phosphate (Dihydrate)* : It is commonly used as a tablet diluent. It is used primarily as a directly compressible diluent. It is non-hygroscopic. It has interesting applications in vitamin- mineral formultions as both, a direct compaction vehicle and as a source of calcium and phosphorus. It is used primarily as a diluent and binder in direct compaction formulas, where the active ingredient occupies less than 40to 50% of the final tablet weight.

(h) *Calcium sulphate (dihydrate) :* It has been suggested as a diluent for granulated tablet systems, where upto 20 or 30% of active ingredient are added to stock calcium sulphate granulation. It is economical and has been reported to show good stability with manydrugs.

Other diluents include calcium lactate trihydrate, amylose that is a derivative glucose and some cellulose derivatives such as microfined cellulose, calcium carbonate, glycine, bentonite and polyvinyl pyrrolidone.

Binders or adhesives

Binders or adhesives are added to tablet formulation to add cohesiveness to powders, thereby providing the necessary bonding to form granules; which, after compaction, gives tablet. Granules flow more uniformly fills the die cavity. Granules do not entrap any air, whereas powders may entrap air during compression. The binder is therefore selected on the basis of previous experience, particular product needs, literature available, etc.The primary criterion while selecting a binder is its compatibility with the other tablet components. The binder should also impart sufficient cohesion to the poweders to allow for normal processing. It should, at the same time, allow the tablet to disintegrate and the drug to dissolve upon consumption. It should release the active ingredients for absorption from G.I.T. common binders or granulating agents include the following: Acacia, gelating, tragacanth, gelatin- acacia mixture, cellulose derivatives, glucose,starch paste, polyvinyl pyrrolidone, sucrose, sorbitol, pregelatinized starch, sodium alginate, etc.

(a) *Acacia* : It is a natural gum. It has been used for many years as a granulating solution for tablets. In solutions ranging from 10 to 25% , it forms tablets of moderate hardness. The availability of acacia

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has been uncertain in recent years. Acacia may be contaminated with extraneous material and bacteria.

(b) *Gelatin* : It is good binder . If forms tablets as hard as acacia; but it is comparatively easier to prepare and handle.solutions of gelatin must be used warm, to prevent gelling, Increasing the percentage of gelatin in tablets, causes increase in the hardness; and also increases the disintegration and dissolution times. It is sometimes used in combination with acacia.

(c) *Tragacanth* : Like acacia, it is a natural gum. Mucilages of tragacanth are difficult to prepare and use. Thus, tragacanth is added dry and then water is added so that the mucilage formed acts as a binder. Wet granules should be quickly dried in order to avoid or reduce growth of microorganisms.

(d) *Cellulose materials* : Cellulose derivatives such as methyl cellulose, hydroxypropyl methyl cellulose and hydroxypropyl cellulose are common binders and adhesives. They form tough tablets of moderate hardness. They form tough tablets of moderate hardness. They may be used as viscous solutions or added dry, then water is added. They are available in a wide variety of molecular weight which effect the viscosity of the solution as well as their swelling properties.Hydroxypropyl cellulose may also be used as an alcoholic solution to provide an anhydrous adhesive. Ethyl cellulose may be used only as an alcoholic solution, and it may retard disintegration and dissolution rates.

(e) *Polyvinyl pyrrolidone(PVP)* : It is a synthetic polymer. It is soluble in alcohol and it is used in concentrations between 3 and 15% . Granules prepared using PVP- alcohol system dry rapidly, compress well and granules formed have good properties. PVP is particularly used in multivitamin chewable tablets, where moisture sensitivity can be a problem . PVP is used as a binder, in the case of moisture sensitive drugs.

(f) *Starch* : Starch is used as a paste and the tablets are soft and brittle. When starch paste is used as a binder, heat is employed and starch undergoes hydrolysis to dextrin and then, to glucose. Thus,care must be exercised in the preparation of starch paste, in order to produce a correct and consistent ratio of starch and its hydrolysed products, as well as to prevent charring.

(g) *Sucrose* : It is used as a syrup, in the concentrations of 50 to 75% of sucrose. It shows good binding properties. Tablets prepared using syrup alone are brittle and hard. The quantity of syrup added and the rate of addition of syrup must be carefully controlled. Overheating should be avoided, while drying the granules, or charring of the granules may occur.

Glucose, as a 50% solution , can also be used as a binder and has the same applications as sucrose.

(h) *Soluble or dispersible binders:* These include alginic and sodium alginate, magnesium aluminium silicate, tylose, polyethylene glycol, gum, bentonite and pregelatinised starch. Pregelatinied starch can be blended dry with the various components of a tablet formula, and then, water is added.

Table : gives examples of some granulating systems

Typical granulating systems.		
Binder	*Percentage of granulating system*	*Percentage in the formula*
Acacia	10-20	2-5
Cellulose derivatives	05-10	1-5
Gelatin	10-20	1-5
Gelatin-acacia	10-20	2-5

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Glucose	25-50	2-25
Polyvinyl pyrrolidone	03-15	2-5
Starch paste	05-10	1-5
Sucrose	50-85	2-25
Sorbitol	10-25	2-10
Pregelatinized starch	02-05	1-5
Tragacanth	03-10	1-4
Sodium alginate	03-05	2-5

Disintegrants

These are substances that are added to the tablet formula which facilitate the break up of a tablet after administration, when the tablet comes in contact with an aqueous medium in the stomach or gastrointestinal tract. Disintegration agents maybe added prior to granulation or during the lubrication step, prior to compression or at both the stages. In other words, disintegrants added may be intragranular (inside the granules), intergranular (in between the granules) or both together. Intergranular disintegrants are also referred to as extragranular disintegrants.

The disintegration of the tablet may be caused bythree machanisms.

(a) *By swelling* : After absorption of water from aqueous environment, the disintegrant swells and because of an increase in the internal pressure, the tablet bursts or explodes, thus cusing disintegration. Absorption of water by a disintegrant may take place by capillary action.

(b) *By penetration of aqueous medium* : The aqueous fluid present in the gastrointestinal tract may penetrate the table and thus cause erosion or breaking up of the tablet mass, thus releasing the contents.

(c) *Liberation of gas, by chemical reaction (Effervescence)* : A tablet may contain ingredients which when come in contact with the aqueous environment of the gastrointstinal tract, react and a gas, usually carbon dioxide, is evolved. This evolution of gas causes the tablet to break up into smaller fragments, thus causing disintegration and release of the active ingredients from the tablet.

Six basic categories of disintegrants have been described as follows:

(i) Straches (ii) Clays (iii) Celluloses (iv) Algins (v) Gums (vi) Miscellaneous.

(i) *Starches* : These are the most common disintegrating agents starches show a grate affinity for water, through capillary action: resulting in expansion and subsequent disintegration of the compressed tablet. Higher levels of starch in the tablet cause more rapid disintegration. However, high starch levels often result in loss of bonding, cohesion and hardness. It is important to dry starch at 80 °C to 90 °C, to remove absorbed water. Starch derivatives, with excellent disintegrating properties have recently become available. These modified starches increase in volume by 200 to 300% is water.

(ii) *Clays* : Clays such as veegum and bentonite have been used as disintegrants the use of clays in which tablets in limited beçause of the tendency of the tablet to discolour they are effective and less expensive.

(iii) *Celluloses* : These have not been found to be widely accepted only microcrystalline cellulose exhibits very good disintegragt properties when present at alevel as low as 10% it functions by allowing water to enter the tablet matrix by means of capillary6 pores Exessively high levels of microcrystalline celulose can result in tablets which have a tendency to stick to be tongue.

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(iv) *Algins (alginates)* : These are hydrophillic colloidal substances they are available as alginic acid or salts of alginc acid they are effective disintegrants and are used at the level of 5 to 10% they have a great affinity for water.

(v) *Gums* : Gums are used as disintegrants because of their tendency to swel in water. They display good binding characteristics when wet this property is opposite to disintegration and the amount of gum in the tablet must be carefully controlled common gums used are agar, guar, gum, karaya gum, pectin and tragacanth.

(vi) *Miscellaneous* : These include surfactants, resins, effervescent mixtures and hydrous aluminium silicate cros- - linked poly vinyl pyrrolidone (pvp) show superior disintegrant qualities.

Table : gives certain examples of disintegrants.

Material	*Concentration (%w/w)*
Starches	2-10
Gums	2-10
Algins	2-10
Clays	1-10
Cellulose	1-10
Wetting agents (Sodium lauryl sulphate)	0.1-0.5

The general method of adding the disintegrant to the formulation is to divide it into two portions: One part is added to the powdered material before granulation. I.e. intragranular; the other part is added during lunbrication before compression, i.e. extragranular, intragranular disintegrants helps individual granules to break up into smaller particles or powder and estragranular disintegrants broak up tablets into granules.

Lubricants, Antiadherents and Glidants

The main function of tablet lubricants is to reduce the friction arising at the interface of tablet and the die wall, during comprression and ejection. Though the functions of lubricants, anti adherents and glidants are overlapping these may be defined as follows:

Lubricants : These reduce the friction between the granulation and die wall during compression and ejection.

Antiadherents : These prevent sticking to the punch and to a lenses extent the die wall.

Glidants : These improve the flow characteristics of the granulation. Each of these will be described in detasls.

Lubricants : Lubrication is considered to occur by two mechanisms. The first is termed as fluid lubrication, because the two moving surfaces are viewed as being separated by a continuous layer of fluid. Ahydrocarbon, such as liquid paraffin, is an example of a fluid type lubricant. The second mechanism is of boundary lubrication, which results from the adherence of the polar portions of molecules with long carbon chains to the metal surface of the diewall. Magnesium stearate is an example of boundary lubricant. Boundary type lumbricants are better fluid type lubricants, since the adherence of a boundary type lubricant to the diewall is greater.

Lubricants tend to equalize the pressure distribution in a compressed tablet and alao to increase the

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density of the particle bed prior to compression. When lubricants are added to a granulation, they form a coat around the individual particles, which remains more or less intact during compression. This coating effect may also extend to the tablet surface.

Lubricants are usually hydrophobic. The presence of a lubricant coating may cause an increase in the disintegration time; and may also cause a decrease in the drug- dissoulution rate. Presence of a lunbricant may give rise to a mechanically weaker tablet, because the lubricant coating may interfere with the particle-to – particle bond as the particle size of the granules decreases, formulas generally require a greater percentage of lubricant. Usualy, as the concertration of a lubricant increases, the disintegration time increases and also the rate of dissolution decreases.

Lubricants may be further classified depending upon their water solubility. Water insoluble lubricants, in general, are more effective than water soluble lubricants. Generaly, whether the lubricant is water soluble or water insoluble it should be of 200 mesh or finer. Since lubricants function by coating the surface of granules their effectiveness and efficiency is related to their surface area which depends upon the particle size of the lubricant. Water insoluble lubricants include stearates such as magnesium stearate, calcium stearate, sodium stearate, stearic acid and talc, waxes, etc. Water soluble lubricants include boric acid sodium acetate, sodium benzoate, sodium chloride, DL- lequcine, sodium lauryl sulphate, magnesium lauryl sulphate, poly ethylene glycol 600, sodium oleate, etc. Steartes and talc are used in the concentration of 0.5 to 2 percent and water-soluble lubricants are used in the concentration of 1 to 5 percent. Lubricants are generally added dry at a stage where the other components are in a homogenous state. The lubricant added and mixed for a period of only 2 to 5 minutes. Overmixing mey; lead to decrease in disintegration and discolution rates. Lubricants may also be added as alcoholic solutions (e.g.polyethylene glycols) and as emulsions and suspensions of lubricant materials. Powder lubricants should to be added prior to wet granulation, since they will he distributed throutghout the granulation particles and will not be concentrated on granule surfaces.

Water soluble lubricants are, in general used only when a tablet must be completely water soluble,as in the case of effervescent tablets. Boric acid, as a water soluble lubricant is questionable due to recognized Boron toxicity.

A lubricants premary function is to reduce the friction between the die wall and the tablet edge, as the tablet is ejected. Lack of adequate lubrication causes binding which causes strain on the machine and can lead to damage of lower punch heads and even formed on the dei wall, and ejection of the tablet is difficult. Such tablets usually show vertical scratches on the edges or periphery, and are not smooth. With excessive binding in the die the tablets may be cracked and fragmented.

Antiadherents : Antiadherents are used in formulas, which show picking and sticking. Sticking refers to adherence of the material to punch faces and a film of material is formed on the punch face. The advanced stage of sticking is referred to as sicking. In picking the portions of the tablet faces are fitted or picked out and adhere to the punch- face. Talc, magnesium stearate and cornstarch display excellent punch face or antiadherent properties. Among the water-soluble antiadherents, Dl- leucine functions very well. Aerosil (silicic acid) is also used as an antiadherent. Metallic stearates also have good antiadherent properties.

Glidants : Glidants improve the flow properties of the granulations, and granules flow smoothly and uniformly from the hopper into the feed frame or die cavity. They act to minimize the tendency; of a granulation to separate or segregate due to excessive vibration. High- speed tablet machines require a smooth and even flow of material to the die cavities. Glidants include talc, corn, starch, aerosol, etc.

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Colorants

Colours are incorporated in the tablet for one or more of the given three purposes.

1. Colours may be added for indentifying similar looking products.
2. Colours can reduce and minimize the possibility of mix-ups.
3. Addition of colours usually improves the aesthetic value or Marketing value of the tablets and at the same time, disguise the off coloured drug. The availability of natural vegetable colours is limited and these colours are often unstable. Two forms of colour have typically been used in tablet preparation these are FD and C colours and D and C dyes. Dyes are water soluble materials while lakes are formed by the adsorption of water soluble dye on inert material such as hydruous oxide(usually aluminium hydroxide).Methods of incorporation of colour include dissolution of the watersoluble dyes in the granulating system or binder solution. This method assures uniform distribution of colour through the granulation, but may lead to mottling during the drying process. Another method is the adsorption of colour onto carriers such as starch, lactose , calcium sulphate, sugar etc from aqueous or alcoholic solutions of the colour. The resultant colour mixtures are dried and used as a stock. Water soluble dyes may be dry-blended with an excipient, prior to the final mix, lakes are usually blended with other dry excipients because of their insoluble nature, Usually direct compression formulas include lakes because no granulation step is involved.

Flavours and Sweetners

Flavours are usually limited to chewable tablets or other tablets intended to dissolve in the mouth. Water soluble flavours have poor stability. Flavours are incorporated as solids in the form of spray-dried particles, and as oils which are sprayed as alcoholic solutions over the granules prior to compression. Since, oxidation destroys the quality of a flavours, oils are usually emulsified with acacia; and spray dried. Dry flavours are easier to handle and more stable than oils. Flavors are volatile and therefore they should not be added prior to any operation involving the use of heat. Sweeteners are added primarily to chewable tablets or lozenges. The only artificial sweetner currently approved is saccharin sodium, which is about 500 times sweeter than (sucrose) sugar. The disadvantage of saccharin is its bitter after taste. This can sometimes be minimised by adding a small percentage (usually 1%) of sodium chloride. Aspartame is another artificial sweetner, but it is not approved for drugs. Manitol, sucrose and dextrose are also used as sweetening agents.

Miscellaneous Components such as Buffers and Adsorbants

Adsorbents such as aerosol, magnesium oxide, a magnesium carbonate are capable of retaining large quantities of liquids without becoming wet. This allows many oils, fluid extracts and eutectic mixtures to be incorporated into tablets. Silicon dioxide is capable of holding 50 % of its weight of water and still remain free- flowing powders. Silicon dioxide exhibits glidant properties as well as adsorbent properties. Other adsorbents include bentonite, magnesium silicate, tricalcium phosphate, etc. Adsorbents are used when the tablet formula contains oils or fluids.

After having discussed different tablet excipients, it is necessary to know about the methodology and operating procedures as well as machinery involved in the manufacture of tablets.

In order that a drug, to be formulated in a tablet form is suitable for administration to produce the desired effect in the body; the material must have attributes and possess desirable physico- chemical characteristics. These include properties such as compressibility and flowability. The material to be formed into a tablet must possess good flow properties, so that the material flows evenly and uniformly

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to the feeding device such as feed frame of the tablet machine or to the die cavity. If the material does not flow uniformly, it may give rise to problems such a overweight tablets or off – weight tablets. Therefore, flow properties of the soild to be compressed are critical for an efficient tabletting operation. A good flow of the material to be compressed in necessary to assure efficient mixing and acceptable weight uniformity. Powders are considerd "Poorly flowable:, since particles are in a very fine state of subdivision and because of more surface area, frictional resistance offered is greater. If powders are converted into small spherical masses called granules, the flowability is improved. This is due to the reduction in frictional forces, since these granules have less surface areas as compared to fine powders.

Another important criterion is comperssibility. The ability of the material to form a compact under pressure is dependent upon the compressibility characteritics of the material. Powders which form hard compacts under applied pressure without chipping are considered as readily compressible. These material.can be readily compressed ; by using directly compressible excipients. For other material , a granulation step is recommended.

Depending upon the physical characteristics of the material any one of one of the following methods may be used for compaction of the material into a tablet:

(A) Wet granulation

(B) Dry granulation

(C) Direct compression

The properties of a tablet are affected by both, the formulation and the method of manufacture. A suitable formulation is critical to the manufacture of satisfactory tablets. However, the formulation must be designed according to the needs, advantages and limitations of the manufacturing method and equipment used.

Wet granulation

This method of making granules involves the following steps:

1. Milling of drugs and excipients.
2. Mixing of milled powders.
3. Preparation of binder solution.
4. Mixing of binder solution with powder mixture, to form a wet mass.
5. Coarse screening of the wet mass using 6 to 12 mesh screen.
6. Drying the moist granules.
7. Screening of dry granules, throught 14 to 20 mesh screen.
8. Mixing the screened dry granules with lubricants, disintegrants.
9. Tablet compression.

The preparation of granulations for tabletting by wet granulation is the oldest method. It is still the most widely used method.However, it involves more labour, considerable material handling and several processing steps. It is comparatively a more expensive method . However, this method continues to find extensive applications. The reason for this are that the method assures content uniformity in the tablets; and it can be used for those formulations where direct compression is not feasible. Another advantage of wet granulation is that the drying cyclye of the process can be manipulated to produce granules with a low moisture content.

The advantages and disadvantages of the wet granulation method, therefore, may be summarised as follows:

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Advantages

1. The cohesiveness and compressibility of powers is improved because of the formulation of agglomerates called granules.
2. High dose drugs having poor flow or compressibility properties can be prepared by wet granulation.
3. Good and uniform distribution and therefore, uniform content for soluble low dosage or potent drugs is obtained and colour distribution is also more uniform as compared to direct compression.
4. It prevents segregation or separation of components of a homogeneous powder mix during processing.
5. The dissolution rate of hydrophobic (water-repellent) drugs may be improved by the wet granulation method.

Disadvantages

1. Cost : It is an expensive process, because of the labour, time, equipment, energy and space requirements.

2. Wet granulation cannot be used for moisture sensitive drugs, which are degraded in the presence of water, moisture or an aqueous environment.

3. The use of soluble dyes in wet granulation often causes migration of the dyes during dying.

4. Any incompatibility or chemical reaction between the formulation components will be aggravated by the moisture used during granulation.

The various steps involved in the wet granulation process have a significant effect on the tabulating properties of the resulting granulation. It is therefore important to understand process parameters, because they have impact on process design and selection of ingredients. The following important step are involved in the wet granulation process.

(a) Preparation of the powder mixture with screening and mixing.

(b) Addition of the binder solution and mixing with powder to proper wetness and wet screening the mass.

(c) Drying the solid liquid blend (wet granules)

(d) Milling the dry granulation to size.

(e) Addition of lubricant, glidant, and/or other excipients prior to compression.

Wet granulation consists of moistening the mixture of the active ingredient and the diluent with the granulating liquid comprising the binder in solution in water, alcohol or a mixture of these two, or any other acceptable liquid to moisten and bind the powders together by causing the particles to adhere to each other. The wet mass produced should have a dough-like consistency : so that a handful can be formed into a shape without crumbling. If the wet mass has a tendency to stick, the granulation is usually too wet. The wet mass is then passed through a standard 4, 6, 8 or 12 mesh screen. The wet granules are then sufficiently dried, passed through a 20 mesh screen, lubricated and compressed into tablets.

Dry granulation

Dry granulation refers to the granulation of a powder mixture by compression and without the use for heat and a solvent. When direct compression is not possible due to the properties and dose of the

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drug, and wet granulation cannot be used because the drug is sensitive to moisture and heat, then dry granulation remains the only method available, e.g., granulation of Aspirin and granulation of effervescent products. The basic procedure is to form a compact of the material by compression, and then, to mill the compact to obtain a granulation. Two methods are used for dry granulation. The more widely used method is slugging, where the powder is precompressed on a heavy-duty tablet press; and the resulting tablets or slugs (big tablets) are milled to yield the granules. The other method is to precompress the powder with pressure rolls, using a machine such as chilsonator.

Dry granulation involves the following steps :

1. Milling of drugs and excipients.
2. Mixing of milled powders.
3. Compression into large hard tablets to make slugs.
4. Screening of slugs.
5. Mixing lubricant and disintegrate.
6. Tablet compression.

Advantages

Dry granulation or slugging has the following advantages :

1. It uses less equipment and space.
2. It eliminates the need for a binder solution and heavy mixing equipment.
3. It eliminates the time-consuming and costly step of drying required in wet granulation.
4. It can be used for moisture-sensitive materials.
5. It can be used for heat-sensitive materials.
6. Tablets show improved disintegration, since powder particles are not bonded together by a binder.
7. Improved solubility.
8. Improved blending, since there is no migration of active ingredients as might occur during drying of wet granules.

Disadvantages

The following are the disadvantages of dry granulation or slugging :

1. It requires a specialized heavy-duty tablet press to form the slug.
2. It dose not permit uniform colour distribution, as can be achieved with wet granulation.
3. A pressure roll press, such as a chilsonator, cannot be used with insoluble drugs, since it may retard the dissolution rate.
4. This process creates more dust than wet granulation.

Slugging is often referred as precompression or double compression. The excipients used in dry granulation are basically the same as those used in wet granulation or direct compression. With dry granulation, it is often possible to compact the active ingredient. With a minor addition of lubricant and disintegrating agent, so that the active ingredient would constitute the bulk of the final product. This is the major advantage of dry granulation. Fillers used in dry granulation include lactose, dextrose, sucrose, microcrystalline cellulose, calcium sulphate, dicalcium phosphate, tricalcium phospate and starch.

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Direct compression

Until the 1950's the vast majority of tablets produced were manufactured by a process requiring granulation. The primary purpose of the granulation step was to produce a free-flowing and compressible mixture of active ingredients and excipients. The availability of new excipients, especially diluents, and the invention of new tablet machinery have allowed the compression of tablets by the much simpler procedure of direct compression. However, inspite of the many distinct advantages of direct compression, it has not been universally adopted. The form ''direct compression'' was longused to identify the compression of a single crystalline compound; such as sodium chloride or potassium bromide, into a compact without the addition of any other substances. Few materials possesses the flow, cohesion and lubricating properties under pressure to make such compacts possible.

The term direct compression in now used to define the process by which tablets are compressed directly from powder blends of the active ingredients and suitable excipients, which will flow uniformly into a die cavity and form into a firm compact. No pretreatment of the powder blent is necessary. Occasionally, potent drugs are sprayed in the form of solution onto one of the excipients. Because of the advent of directly compressible vehicles, this method of tablet compression was made possible. These vehicles possesses fluidity and compressibility. The first such vehicle was spray dried lactose ; microcrystalline cellulose. The simplicity of the direct compression process is obvious.

Direct compression involves comparatively few steps :

1. Milling of drugs and excipients.
2. Mixing of ingredients.
3. Tablet compression.

Direct compression should not be taken as a simplified modification of the granulation process. It requires a new and critical approach to the selection of raw materials, flow properties of powder blends and effects of formulation variables on compressibility. During wet granulation, the original properties of the raw materials are, to a great extent, completely modified. This is not the case in direct compression. Therefore, the properties of each and every raw material and details of how these materials are blended become extremely important.

Advantages of direct compression

1. Economy due to reduced processing time and reduced labour costs and fewer manufacturing steps.
2. Elimination of heat and moisture, thus increasing stability of the active ingredients.
3. Prime particle dissociation, which is one of the least recognized advantages of direct compression. In the case of direct compression, after disintegration, each primary drug particle is liberated. In the case of granulation small drug particles, with a large surface area are glued together into larger agglomerates; thus decreasing the surface area available for dissolution.
4. Stability of the formulation is improved.
5. Particle size uniformity.

Disadvantages of direct compression

1. Problems in the uniform distribution of low-dose drugs.
2. High dose drugs having high bulk volume, poor compressibility and poor fluidity are not suitable for direct compression e.g. Aluminium hydroxide, magnesium hydroxide.

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3. The choice of excipients for direct compression is extremely critical. Direct compression filler-binders must posses both, compressibility and fluidity, and in most cases these are speciality items available from one supplier.

4. Direct compression excipients often cost more.

5. Many active ingredients are not compressible, either in their crystalline or amorphous forms.

6. Direct compression blends are subject to unblending.

The lack of moisture may give rise to static changes, which can lead to unblending. Similarly, difference in particle size or densities of drug and excipients may also lead to unblending.

7. Non-uniform distribution of colour, especially in tablets of deep colours.

Direct compression tabletting should not be considered an easy or simple process, but rather an alternative method of making tablets, having cost and stability advantages. The physicochemical properties of individual ingredients such as particle size, fluidity and moisture are critical in direct compression tabletting. The key of success in direct compression formulations is more closely associated with the functional behaviour of excipients, particularly the filler-binder. An ideal direct compression excipient should possesses the following attributes :

1. The material should have high flowability.
2. It should have high compressibility.
3. It should be phsysiologically inert.
4. It should be compatible with all active ingredients.
5. It should not show any physical or chemical change or aging and should be stable to air, moisture and heat.
6. It should have high capacity i.e. the amount of active ingredients which the diluent can successfully carry.
7. It should be colourless and tasteless.
8. It should accept colourants uniformly.
9. It should be inexpensive.
10. It should possess proper mouth feel, if used in chewable tablets.
11. It should not interfere with the biological availability of active ingredients.
12. It should have particle size range equivalent to active ingredients.
13. It should be capable of being reprocessed.
14. It should possess good hardness after compression.

Tablet compression operation

Tablets are made by compressing a formulation containing a drug of drugs and excipients, on a tablet press. Tablet compression machines are designed with the following basic components :

(a) Hopper or hoppers, for holding and feeding the material to be compressed.

(b) Dies, which define the size and shape of the tablet.

(c) Punches, which compress the granules within the dies.

(d) Cam tracks, for guiding the movement of the punches.

(e) A feeding mechanism which moves granules or material to be compressed from the hopper into the dies.

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Tablet compression machines or tablet presses are of two basic types :

1. The single-station or single-punch press.
2. Multistation or rotary press.

Single Punch Tablet Compression Machine

This consists of a die and a set of punches the lower punch and the upper punch. The lower punch can move freely in the die cavity, the horizontal metal platform holds the die firmly. There are two important features of the lower punch assembly. Firstly it can vary the depth to which the lower punch falls or descend in the die cavity. Thus it can control the volume or weight of the material to be compressed. Secondly, the lower punch can be adjusted in such a way that at the top of the compression cycle, the lower punch is exactly at the same level as the upper surface of the die, i.e. the lower punch comes flush with the die surface. The upper can be fixed in such a way that it enters the die cavity corrects on its downwards stroke. The depth to which the upper punch descends can be controlled, thus controlling the pressure applied on the material. Thus, the upper punch can control the hardness of the compressed tablet.

Compression cycle

1. The first stage is the filling stage during which the upper punch rises and the hoper containing the granules rotates till it is over the die. The lower punch is lowered or drops to a present position adjusted by the capacity regulating screw; to form a cavity in the die to provide a volume corresponding to the correct fill weight. Granules or the materials to be compressed are filled in the die.

2. The bottom punch now remains stationary while the upper punch descends into the die, compressing the granules filled in the die cavity.

3. The upper punch now rises, and then the lower punch also rises flush with the surface of the die, to eject the tablet to the surface.

4. The feed shoe or hoper-shoe now rotates over the die cavity; and knocks the finished tablets aside. The hopper now again fills the die cavity and the cycle is repeated.

Rotary Tablet Compression Machine

Multistation tablet presses are termed as rotary presses because the head of the tablet machine, that holds the upper punches, dies and lower punches in place, rotates. As the head rotates, the punches are guided up and down by fixed cam tracks, which control the sequence of filling, compression and ejection. The portions of the head that hold the upper and lower punches are called the upper and lower turrets respectively, and the portion holding the dies is called the die tablet.

At the start of the compression cycle, the granules stored in a hopper empties into the feed frame. The feed frame has several interconnected compartments. These compartments spread the granules over a wide area to provide time for the die to fill. There are two sets of cams provided the pull down can guide the lower punches to the bottom of their vertical travel allowing the dies to over fall. The lower punches then pass over a weight control cam, which reduces the fill in the dies to the desired amount. There is a wipe off blade at the end of the feed frame. This wipe-off blade removes the excess granules and directs it around the turret and back into the front of the feed frame. There are two compression rolls, the upper and the lower. The lower punches then travel over the lower compression roll while, at the same time, the upper punches ride beneath the upper compression roll. The upper punches enter a fixed distance into the dies, while the lower punches are raised to squeeze and compact the granules

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within the dies in order to regulate the upward movement of the lower punches the height of the lower pressure roll is changed. After compression the upper punches are withdrawn (raised slowly) as they follow over the upper punch raising cam. The lower punches ride up another cam which brings the tablets flush with the surface of the dies. The exact position is determined by a threaded bolt called the ejector knob, the tablets formed then strike a sweep-off blade, which is affixed to the front of the feed frame. The tablets then slide down a chute into a receptacle at the same time, the lower punches re-enter the pull down cam. The cycle is repeated many tablet machines are designed so that the compression cycle is accomplished more than once, while the machine hed makes a single revolution.

Although, tablet compressing machinery has undergone numerous modifications over the years, the compaction of materials modifications over the years, the compaction of materials between a pair of moving punches within a stationary die, has remained unchanged. The main modification is increase in production rate. Out put from a tablet compression machine is regulated by three basic characteristics of design :

(a) Number of tooling sets

(b) Number of compression stations.

(c) Rotational speed of the press.

In general, all rotary presses are designed for fast and economical production of all kinds of tablets.

The following table are the points of difference between a single punch machine and a rotary tablet machine.

Single punch machine	*Rotary tablet machine*
1. Compression of the granules or material is abrupt.	1. Compression of the material is gradual.
2. Pressure is exerted by punches; i.e. upper punch and lower punch	2. Pressure is exerted by pressure rolls.
3. During compression, the lower punch is stationary and the upper punch is moving	3. Both the punches are moving
4. Weight of the tablet is adjusted before filling.	4. Weight is adjusted after filling.
5. For feeding the material, a feed shoe is used.	5. Feeding is done with feed frame.
6. This consists of a fixed die plate which holds the die	6. This consists of a revolving turret, in which dies are continuously revolving.
7. This is comparatively less economic and the out put is limited due to the single station.	7. More economic and it gives very high output because of multiple stations.
8. With this machine, there are more chances of tablet capping, because the compression is abrupt.	8. Less chances of tablet capping, because the compression of the material is gradual.

Double rotary machines

These are similar in operation and design to single rotary machines, but possess two pairs of compression rolls, two hoppers, two feed frames and sets of cams. In this type of equipment, each punch set makes two tablets per revolution of the turret unlike in the single rotary where one tablet is mode per revolution by each punch with double the number of compression stations the output in greatly increased. The maintenance of these machines is comparatively more expensive than single rotary machines.

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Drycota machines

This basically consists of two rotary tablet presses joined by a single driving shaft, and a transverse system the tablets made on a turret of one rotary press are transferred to a second turret. The coating is put on cores in the second rotary press, i.e. tablet cores are made on one cotary machine and transferred with the help of a transfer cup and transverse system to another rotary machine, where a coating is impressed upon the cores. Previously compressed cores are fed by a virbrating feeder unit onto a circular feeding disc which is rotated clockwise or anticlock wise, as desired, by a motor. The cores are connected to a vacuum system, through flexible tubing. The cups, which are spring loaded are guided into contact with the cores by means of the cam and the pins. In practice, a bottom layer of coating enters the die from one hopper. At the same time, a core is picked up by a transfer cup which is guided by cam into the die. Then the core rests on the bed of coating. The top layer of granulation is then deposited. The whole is then compressed in the usual manner. The machine usually has 33 compression stations. It can produce a maximum of 900 tablets per minute. There are a number of problems in the operation of this machine.

Problems in tablet manufacture (processing problems)

In the routine manufacture of tablet and in developing formulations various problems occur. Sometimes, the sources of the problems is either the formulation or the compression equipment or it may be a combination of the two. The production of imperfect tablets having certain noticeable defects, is annoying and costly. It indicates improper formulation, or difficulties with one or more processing steps or unit processes or incorrect tablet press setting or operation. The imperfections in tablet are named as follows.

1. Binding
2. Sticking
3. Filming
4. Picking
5. Capping
6. Laminating
7. Chipping
8. Cracking
9. Mottling
10. Weight variation
11. Hardness variation
12. Double impression
13. Tablet expansion.

Binding : Binding is generally due to insufficient lubrication. The resistance of the tablet to ejection from the die cavity, due to adherence to the die wall is called binding in the die. Tablets compressed with sufficient lubrication is not sufficient tablets have rough sides or edges with vertical scratches. Tablets often crack or chip as a result of binding. In case of coloured tablets the edges of such tablets are light in colour. With excessive binding. The tablets are cracked and may crumble apart. The problem of binding can be overcome by cleaning the dies thoroughly and lubricating them appropriately. Increased quantity of more efficient lubricant should be used. Excessive moisture in the granules can also cause binding in the die. Problem of binding can also be solved in some cases by modifying granules to reduce granule size or by increasing punch die clearance.

Sticking : sticking also referred to as ''Filming'' or ''picking'' is usually due to incompletely dried to improperly lubricated granulations. Either of these will allow some of the granules to stick to punch faces. These are usually small fragments from the tablet face at first, but the condition becomes progressively worse with larger and larger pieces of tablet being picked from the face as compression continues. Tablets may chip or break if picking occurs on the lower punch or may pull apart from the upper

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punch. The remedy is to control the moisture in the granulation sticking filming or picking happens more frequently with a single punch machine because of insufficient pressure or top pressure only. On rotary tablet machines increasing the pressure, reducing the running speed and/or increasing the proportion of binder help to over come these defects. Another approach is to use highly polished punches or chromium plated punches. Filming is a form of sticking. It is the slow build up of a thin film at first of the granules on the punches. This is due to loss of polish of the punch faces. Film build up is also caused by high humidity or high temperature. Filming or sticking may be caused by rough or scratched punch faces and nicked punch tips. Filing may be caused by oily or waxy materials or too little lubrications. Filming can be overcome by changing the granules changing or decreasing the lubricant, adding and adsorbent cleaning or polishing punch faces.

Capping and lamination

Capping is the defect in which the top or upper segment of the tablet is cracked around the edge or separated as a cap. It is usually due to air entrapped in the die which is compressed as punches move together to apply pressure, and which then expands when the pressure is released. This is very common when granules contain large percentage of fines. Lamination is caused by the same factors as capping but by; exaggerated conditions at high speed it differs from chipping in that tablets split or crack on the sides by air expansion when pressure is released and then the tablet comes apart in separate layers. This may be due to poorly cohesive or oily granules. In more severe conditions, tablets break apart or tend to explode on ejection the following are some of the remedies of capping and lamination. Remove some or all the fines through 100 to 200 mesh screen. In crease or change the lubricant dry the granules or moisten the granules improve granulation procedure or increase binder or waiting of the granulation.

Chipping and cracking

Chipping refers to the defect in which pieces are broken or chipped out of the tablet. This may occur on the faces of the tablets but usually occurs on the faces of the tablets but usually occurs on the edges. It may be due to sticking or to damaged punches or incorrectly fixed tablet machine. Cracking refers to tablets that are cracked anywhere but often in the centre of the top. Cracking is due to expansion as distinguished from caping or laminating. It may also be due to binding or sticking. Chipping and cracking may be remedied by replacing or refacing nicked or chipped punches, resetting the tablet machine by increasing binder or by wetting the granulation. It can also be corrected by polishing punch tips, removing some or all fines and by reducing the granule size.

Mottling

Mottling is an unequal distribution or colour on a tablet with light or dark areas standing out. The surface of the tablet does not show uniform colour. One reason for mottling is drug whose colour differs from the tablet excipients or a drug whose degradation products are coloured. The use of colourants or dyes may solve this problem but can create other problems. A dye can cause mottling by migrating to the surface of a granulation during drying. To over come this difficulty, the solvent system may be changed, binder system may be changed. Reducing the drying temperature also helps in reducing mottling.

Weight variation

Anything that can alter the die filling process can change tablet weight. Variations in the ratio of small to large granules also may cause weight variation. If large granules are used to fill small die cavity, relatively few granules are required and this also can lead to weight variation. The filling of the

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die is based on a continuous and uniform flow of the granules from the hopper. When the granules do not flow readily, the flow is not uniform and some dies are incompletely filled and this leads to off-weight tablets. Similarly weight variation may occur when the machine speed is in excess. With poor flow, addition of a glidant such as talcum or colloidal silica may be useful.

Hardness variation

Hardness variation is a problem that has the same causes as weight. Variation hardness depends on the weight to the material and the space between upper and lower punches at the moment of compression. If the volume of the material or the distance between the punches varies, hardness also may change. Proportion of binder and method of adding binder also may cause variation in the hardness of the tablets.

Double impression

This involves only punches that have a monogram or other engraving on them. At the moment of compression, the tablet receives the imprint of the punch. During its travel the lower punch may rotate and may make a new impression on the bottom surface of the tablet; resulting in a double impression. The newer tablet machines have antiturning devices as an integral part of their design and contraction and hence there is no such problem of double impression.

Tablet expansion

Expansion of the tablet immediately after compression is a contributing factor or may tablet defects. Expansion of the tablet during compression may lead to caping. Expansion varies greatly with different types of materials. As the granules are compressed, expansion takes place against die walls, and as the tablet is being ejected from the die this expansion is still taking place and the tablet has to be forced out of the die cavity. This added friction causes tablets to cap or laminate. This can be easily recognised as the tablet makes screeching sound as it is ejected from the die. This problem may be overcome by tapering the dies a few thousand of an inch. This allows the tablet to expand without capping, laminating or breaking.

Coating of Tablets

Tablets are coated for the following reasons :

1. To prevent changes occurring in the tablet due to atmospheric conditions like moisture oxidation, reduction, action of carbon-di-oxide etc.
2. To mask unpleasant taste and odour.
3. To improve the appearance of tablets.
4. To control the site of action of drugs i.e. enteric coating.

Tablet coating has been classified into following types.

(a) Sugar coating.
(b) Film coating.
(c) Enteric coating.
(d) Compression coating.

Processes employed for tablet coating may be

(i) Pan coating
(ii) Compression coating
(iii) Air suspension coating

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(iv) Dip coating

(i) Pan coating : In pan coating, a stainless steel or coper pan is used the regular method or sugar coating is as follows :

Syrup containing 2 parts of sugar and one part of water is prepared. Dusting powder consisting of 50 parts of starch 10 parts of purified talc and one part of acacia may be used. The proportions and the composition of dusting powder may vary.

The tablets to be coated are placed in the pan. The speed of the pan is so adjusted that the tablets tumble in the pan. Hot air is blown in. The syrup is added in portions. After each addition of the syrup, dusting powder is sprinkled. The dusting powder does not allow tablets to stick together. The alternative addition of syrup and powder is repeated until a desired coat is built up. Towards end only warm syrup is added followed by cold syrup and the tablets are dried by blowing in cold air. This helps in obtaining a smooth surface.

(ii) Compression coating : In this method granules of coating material are prepared and a layer of coating material is placed under the core tablet (i.e. tablet to be coated) and a layer above the tablet, in the die of a tableting machine and compressed. Then whole operation is carried out in series of automatic operations. Drycota type of machines are normally used for the purpose.

Enteric coating : This type of special coating is employed for the following reasons.

(1) Where it is desired that the tablet should not disintegrate in the stomach. Non-disintegration is desired where the active ingredient of a pill irritates the mucous membrane of the stomach or where it is suspected the active ingredients are rendered inactive by acid juice present in the stomach.

(2) Substances such as anthelmintics and amoebicides are required for concentrated effect in the intestine where the parasitic worms and protozoa breed.

Coatings of certain substances are not dissolved in acidic juice but readily dissolve and release the medicaments in the alkaline medium of the intestine. Thus substances used for entering coating include keratin shellac, salol, stearic acid. Cellulose acetate insolution. Gelatin treated with formaldehyde also forms a material for enteric coating.

For small scale work the laboratory method is used. For large scale coating pans is used. The tablets to be coated are all placed in a coating pan which are made to rotate at such a speed that the tablets tumble i.e. they float in the air without touching the sides of pan. The coating material in the form of a solution is poured in portions, into the pan. Simultaneously warm air is blown into the pan. Which in addition to drying helps the tumbing process.

The enteric coating is a trade secret. Methods for enteric coating have been devised on time and moisture and these methods are independent of acidic or alkaline medium.

Polishing

To have better elegance the coated tablets are then placed in a polishing pan which have canvas covered by a layer of wax. Thus tablets receive a layer or thin film of wax, giving the tablets a polished look.

Quality control tests for tablets

The standards to control the quality of the tablets were adopted for the first time in British pharmacopoea 1932 amendum VII 1945.

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The various standards which are considered for this purpose are as under :

1. Appearance
2. Shape
3. Uniformity of weights of tablets.
4. Percentage of active ingredients in tablets
5. Rate of disintegration
6. Mechanical strength
7. Diameter

1. Appearance : The tablets should have good appearance, uniform texture, smooth suface and should be free of any extraneous matter or foreign particles.

2. Shape : Pharmacopoeia has defined the shape of tablets as flat or convex disc, and may have lines or break markes, a symbol or any other markings.

3. Uniformity of weights of tablets : Though the small variations in the weights of individual tablets are invitable and admissible, the variations should not cross the limits are specified in the pharmacopoeia. For standardisation according to Indian pharmacopoiea 20 tablets are used, if 20 are not available, 10 tablets much be used 20 tablets are weighed individually and their average weight is calculated. Only uncoated tablets should be used.

Following table shows the deviations from the average weight.

Uniformity of weight of tablets

Sr No.	*Average weight*	*Percentage deviation*
1.	80 mg or less	10
2.	More than 80 mg and less than 250 mg	7.5
3.	More than 250 mg	5.0

Not more than 2 tablets should fall out side this limit if 20 tablets are taken for standardization and only 01 if 10 tablets are available.

However in no case the test is considered satisfactory if more than one tablet exceeds the average weight by more than twice the deviation specified in the above table.

4. Percentage of active ingredients in the tablets : Percentage of active ingredients in case of official tablets are mentioned in the individual monographs. The variation may be due to several factors such as variation in weight of tablets purity of the medicament, errors in random sampling or process or preparing granules. Following table shows the permissible variations are mentioned in Indian pharmacopoeia. These are based on the requirement of 20 tablets for assay. If 20 tablets are not available at least 5 tablets should be used. The table is applicable when the stated limits are between 90% and 110% of medicament.

Percentage of active medicaments in tablets

Sr No.	*Weight of drug in each tablet*	*Substract from the lower limits of samples of*			*Add to the upper limits for samples of*		
		15	10	05	15	10	05
1.	120. mg or less	0.2	0.7	1.6	0.3	0.8	1.8
2.	More than 120 mg						

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	and less than 300 mg	0.2	0.5	1.2	0.3	0.6	1.5
3.	More than 250 mg.	0.1	0.2	0.8	0.2	0.4	1.0

Rate of disintegration : Unless otherwise mentioned in the monograph, time required for disintegration of five tablets in the prescribed manner is not more than 15 minutes, and not more than one hour for sugar coated tablets.

Tablet disintegrating test

The pharmacopoeia specifies disintegration time for tablets depending on the purpose for which tablet is to be used. For example a lozenge tablet is not subjected to disintegration test as it is required to dissolve slowly in the mouth.

A tablet required to prepare a solution must disintegrate quickly and hence a time limit is specified.

Tablet intended for oral use are expected to disintegrate and the pharmacopoeia specifies this time as 15 minutes.

The apparatus used for disintegration test consists of the following :

Instrument to be used for tablet disintegration test IP 1985 is described below.

A horizontal strip with clamp at one end is screwed to the shaft. The basket having 6 tubes of 7.75 cm long with a diameter of 21.5 mm fitted at the lower end with a disc of stainless steel wire gauze of 10 sieve is fixed to the clamp one liter Glass beaker filled with; water is kept under the basket. The water in the breaker is maintained constant at 37°C temperature ± 2°C by means of thermostat fitted on the front panel.

The shaft with the basket moves vertically up and down through a distance of 5 cm. At the highest position of the basket the wire gauze remains at 2.5 cm below the surface of the water and at the lower position it remains 2.5 cm up from the bottom of the beaker.

The mechanical movement of the shaft is also adjusted that complete up and down movement of the basket is repeated thirty times per minute.

A motor is used with reduction gear system, which moves the shaft up and down on the upper platform of the cabinet.

Unless otherwise specified the disintegration test apparatus is operated for one hour in case of coated tablets.

Soluble dispersible tablets should disintegrate with in three minutes.

Enteric coated tablets should not disintegrate for 2 hours in 0.1 NHCl as immersion liquid, while in alkaline pH at 6.8 they should disintegrate within one hour.

Mechanical strength : No standards have been adopted by any pharmacopiea for the mechanical strength it is due to fact that several difficulties are involved in devising a suitable test.

Pharmaceutical manufacturers employ themselves many test to ensure that tablets withstand the normal risk of handling transporting etc.

(a) Monsanto hardness tester : The monsanto chemical Co. Ltd. has designed spring-pressure devise to test the hardness.

The tablet to be tested is placed between the spindle and anvil and pressure applied by turning the screw knob just to hold the tablet in position. The reading of the indicator on the scale is adjusted to zero. The pressure is applied until the tablet breaks. Note the reading.

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(b) Pfizer tablet hardness tester : The another devise developed and known as Pfizer tablet hardness tester operates on the principle of ordinary pliers. The jaws holding the table vertically under test are squeezed by hand until it breaks, the breaking point being indicated by a needle on a calibrated dial.

(c) Roche-friabilator : Though the tablets are compressed to satisfactory hardness during manufacturing yet show considerable powdering after normal handling giving undesired appearance. These tablets are described as friable tablets and may result due to addition of non cohesive or even due to high proportion of dry additives. This can be measured by an instrument know as Roche-Friabilator.

20 tablets are used for testing the plastic drum holding the tablets revolve 25 times in a minute. While revolving the tablets are automatically, packed up from the casing and transferred to a platform which they face from a height of 6 inches onto the floor or the cylinder. At the end of 4 minutes the tablets are withdrawn and weighted. The percentage difference from their original weight is used to express friability. The tablets having not more than 1.6% friability value are considered satisfactory.

Diameter : British pharmacopoeia 1958 specifies standards for diameter of official tablets the diameters are given officially in 32^{nds} of an inch. The largest being 2/32^{nds} and the smallest 6/32^{nds}.

In addition to above Indian pharmacopoeia 1985. Has suggested ''dissolution test'' for few tablets.

Now it has been proved that dissolution has no relevance to disintegration and hence even if the tablet disintegrates as per the prescribed norms it does not mean that it will pass the bioavailability limits. Therefore to ensure the bioavailability for therapeutic effects. Certain tablets must comply the dissolution test in addition to disintegration test.

Storage of tablets

Tablets should be stored in containers which afford protection against breakage moisture and contamination which may lead to deterioration.

Varti kalpanā

गुडेनेति वचनेन यावता गुडेन वर्ति कर्तुं युज्यते तावन्मानो गुडो देयः । (चक्रदत्त)

इयं च वर्ति गुडपाकेन कठिना कर्त्तव्या यथा श्लक्षण भवति । (च.सि. ९.५८-६१ चक्रपाणि)

घृताभ्याक्ता गुदे क्षेप्या श्लक्षण स्वाङ्गुष्ठसन्निभा । मल-प्रवर्तिनी वर्तिः फलवर्तिश्च सा स्मृता ।। (शा.सं.उ.ख. ७.१५)

Synonyms

Phalavarti, Varti

Introduction

Varti is a similar form of *Vaṭī kalpanā*. For making *Varti*, medicine is modified into *Yavākṛti* (long oval shape) solid form, then it is called as *Varṭī kalpanā*. This is commonly used for local administration of following routes viz. *Guda (Anus), Yoni (Vagina), Sisna (penis), Netra (Eye)*. According to the specific route of drug administration, the length and diameter of the *Varti* will be modified. Usually for the purpose of *Vātānulomana* also and *Varṭī* is mainly used to evacuate *Sancita doṣas (mala, mūtra, purīṣa, rakta, kapha* etc. *doṣa)* from the body.

Depending up on the *roga, rogi, sthāna, doṣa* and *karma* different types of *Varti* are mentioned. Eg. *Gudavarti, yonivarti, śiśnavarti, vraṇavarti, netravarti, nāsavarti, dhūmavarti* etc.

General method of preparation of Varti

Usually the *Varti* is prepared by two methods. Medicinal drug powders are made into fine powder form. Then these contents are mixed uniformly in syrup made of jaggery and moulded into required size

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and shape of *Varti.*

Vartis are also made by grinding the fine powder of the drugs with the fluids specified in the formulae to form a soft paste. Then this is made into *Varti* form according to required size and shape.

For making *Gudavarti* the *Guḍa* (jaggery) is used as a base. In certain conditions the *Guḍa* should be equal to the quantity of the *Dravya cūrṇa.*

First of all *Guḍa* and appropriate quantity of water is mixed and *Guḍa* is dissolved in water. Then this liquid is filtered with cloth. Then the obtained liquid is allowed to make *Pāka* by heating. When proper *Pāka* is attained, during that time, the vessel is taken out from the fire and respected *Dravya cūrṇa* is mixed little by little uniformly.

For the preparation of *Phala varti, Auṣada dravya* which are *Vātānulomana, recaka guṇayukta* are selected and made them into fine powder form. The *author Cakra Pāṇi Datta* mentioned that, the base which is used for the preparation of *Varti* should have *Snigdha guṇa* etc. Then only it will bind the *Auṣadha cūrṇa.* Then these contents are mixed with syrup made of juggery. Usually *Guḍa* and *Auṣada Dravya cūrṇa* should be taken equal quantity, otherwise such a quantity of *Guḍa* is taken by which *varti* can be prepared properly. The substance is moulded into a cylindrical and compact suppository of the size and shape of thumb. Then it is called *Phalavarti* or *Gudavarti.* While administering it should be applied with *Ghṛta* and also little quantity of *Ghṛta* should be applied in the interior of the *Guda* (anus) for easy administration.

Gudavarti

The *Gudavarti* is commonly used to remove the *Suṣka purīṣa* and abstructed *Vasti dravya* in *Guda* and for making *Vātānulomana.*

Śiśna varṭī

Śiśna varṭī is prepared for introduction into the urethra. *Sūkṣma cūrṇa,* made of *Yavakṣāra, Suryakṣāra, Sphaṭīkā, Eraṇḍabīja, Gokṣūra, Punarnavāmūla, Pāṣaṇabheda, Tṛna pañcamūla* etc. drugs are used for *Śiśna varṭī* preparation. Size and shape of this *varti* can be prepared according to diameter and length of urethra.

Indication

Mūtrakṛchra, Mūtraghāta, Aśmarī, Mūtrasaya Śūla, Uṣṇavata.

Dhūmavarti

Described in *Dhūmapāna Kalpanā* chapter

Netravarti-Candrodaya Varti

शङ्खनाभिर्विभीतस्य मज्जा प्रथ्या मनःशिला। पिप्पली मरिचं कुष्ठं वचा चेति समांशकम्।।
छागीक्षीरेण संपिष्य वर्ति कृत्वा यवोन्मिताम्। हरेणुमात्रं संघृष्य जलैः कुर्यादथाञ्जनम्।।
तिमिरं मांसवृद्धिं च काचं पटलमर्बदम्। रात्रयन्ध्यं वार्षिकं पुष्पं वर्तिश्चन्द्रोदया जयेत्।।

(शा. उ. ७५-७७)

Apparatus required

Khalva yantra, Cloth, Vessel etc.

Drugs required

Śankhanābhi : One part

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Vibhītaki majja	:	One part
Harītaki twak	:	One part
Manahṣila (sodhita)	:	One part
Pippali	:	One part
Marica	:	One part
Kuṣṭa	:	One part
Vaca	:	One part
Ajādugdha (Goat milk)	:	Appropriate quantity
Water	:	Appropriate quantity

Procedure

Śankhanābi etc, all drugs, are powdered separately then filtered with cloth, with the help of *Khalva yantra.* Then all the drugs are mixed in equal quantity in *Khalva yantra,* and appropriate quantity of *Ajādugdha* is added and nicely macerated, rolled into *Varti* from equal to the shape of *Yava,* then it is made *Chāyasuṣka* (dried in shade). At the time of application it is made into paste from with water and a quantity of one *Hareṇu* is applied as *Añjana* into the eyes. This recipe known as *Candrodaya varti.*

Āmayika Prayoga

Timira, Māṁsavṛddi, Kāca, Paṭala, Arbuda, Rātryāndhya, one year old *puṣpa.*

Vraṇavarti

Haridra, Nimbapatra, Sphaṭikā, Lavaṅga, etc. drugs are grinded well and *Varti* is prepared and introduced into *Vraṇa* (through *Vraṇcidra*) for its heeling.

Indications

Nāḍīvraṇa, Sukṣma mukha yukta vraṇa etc.

Nāsavarti

Tikṣna and *Krimighna dravya* e.g. *Apamārga bīja, Viḍaṇga, Śirīṣabīija, Kaṭphala, Marica,* etc. drugs *Sūkṣma cūrṇa* are applied over cloth, and this cloth is rolled into long *Varti* and introduced into *Nostril.*

Indications

Śirahśūla, Śirokṛmi, Pratīśyāya, Pīnasa etc.

Phala varti

मदनं पिप्पली कुष्ठं गौराश्च सर्षपाः । गुडक्षारसमायुक्ताः फलवर्तिरिहोच्यते ।। (भै.र. उदावर्ते)

Apparatus required

Mortar & pestle, vessel etc.

Drugs required

Madana phala bīja	:	1 part
Pippalī	:	1 part
Kuṣṭa	:	1 part
Śweta Sarṣapa	:	1 part

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Śarkara	:	1 part
Guḍa	:	1 part
Water	:	Appropriate quantity

Procedure

Except *Guḍa* all above mentioned drugs are made into fine powder. Then *Guḍa* is made into *Pāka* form in a vessel by adding appropriate quantity of water, all the prepared *Cūrṇas* are mixed uniformly and made into *Guḍa varti* form (*Varti* having 2-3 *Angulas* length) and made into the size equal to that of little finger. Then it is preserved in a glass container and kept in moisture less place.

Indication

It is supposed to be administered through *Guda* (anus) only. *Udara vikāra, Malāvarta, Ādhmāna, Anāha.*

Characteristics and preservation of Varti

All the *Vartis* should be molded to get smooth surface. Colour and smell depend on the drugs used. *Varti* can be kept in cotton and preserved in glass container. If *Varti* is having volatile principles, then the container cap should be covered with wax paper to avoid escaping of volatile principles. These can be preserved for one year if kept in air tight container. In case of *Varti* formulations having mineral ingredients, the drugs are preserved indefinitely.

Suppositories

Suppositories are special shaped solid dosage form of medicament for insertion into body cavities other than mouth. They may be inserted into rectum, vagina or the urethra. These products are so formulated that after insertion, they will either melt or dissolve in the cavity fluids to release the medicament. Suppositories varies in shapes, sizes and weights. Generally suppositories weighing 1 to 2 gms are prepared Cocoa butter or glycero gelatin is used as base.

Uses

Suppositories are used for any one of the three different purposes.

1. To produce local action.
2. To produce systemic action.
3. To produce mechanical action on the lower bowel and facilitate evacuation in the treatment of hemorrhoids, anal irritation, constipation etc.

Suppositories are convenient mode of administration of drugs which irritates the gastro-intestinal tract, cause vomiting, are destroyed by the hepatic circulation or destroyed in the stomach by pH changes, enzymes etc.

They can be easily administered to children, old persons and to unconscious patients who cannot swallow the drugs easily.

The rectal suppositories may be used for lubricating, soothing, antiseptic, local anesthetic action or for astringent effect. Therefore they may contain antiseptics, local anesthetics, astringents, hormones and steroids. The rectal suppositories meant for systemic effect contain analgesics, antispasmodics, sedatives and tranquillizers.

The lower portion of the rectum affords a large absorption surface area from which the soluble substances can pass quickly and reach the venous circulation directly and rapid action of the drug is

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produced. However the rate and extent of absorption of the drugs depends upon the nature of the base in which they have been incorporated. The maximum therapeutic effect is produced if the drug incorporated is in the finely divided state, evenly distributed throughout the base and in a readily absorbable form.

The rectal suppositories are extensively used as a mechanical aid to bowal evacuation which produce its action by irritating the mucous membrane of the rectum or by lubricating action. The glycerin suppositories are representative example of evacuante suppositories.

Types of suppositories

Rectal suppositories

These are meant for introduction into the rectum for their systemic effect. They are tapered at one or both ends and usually weigh about 2 gm. The rectal suppositories meant for children are smaller in size and weight than the adult suppositories. They usually weigh about 1 gm.

Vaginal Suppositories

They are also known as pessaries and are meant for introduction into the Vagina. They are larger than rectal suppositories and vary in weight from 3 to 6 gm, or more. They vaginal suppositories may be conical, rod shaped or wedge shaped. They are exclusively used for their local action on the Vagina.

Special shaped suppositories are manufactured and are supplied with applicators to facilitate insertion into the Vagina. Now a days a few special tablets and capsules, oval or suppository shaped are prepared for use in the Vagina and are known as vaginal tablets and vaginal capsules respectively.

Urethral suppositories

They are also known as urethral bougies and are meant for introduction into the urethra. They are long, thin and cylindrical forms rounded on one end. Their weight varies from 2 to 4 gm. and length from 2 to 5 inches. Urethral suppositories are very rarely used.

Nasal Suppositories

They are also known as nasal bougies or buginaria and are meant for introduction into the nasal cavities. They are similar in shape to urethral bougies. Their weight is about 1 gm and length 9-10 cms. They are always prepared with glycero-gelatin base.

Ear Cones

They are also known as aurinaria and are meant for introduction into the ear. They are very rarely used. Generally theobroma oil is used as a base, prepared in an urethral bougies mould and cut according to the required size.

Suppository bases

Since suppositories are special solid dosage form of medicament they must retain its shape, solidity and firmness during storage and administration but must melt or dissolve in the cavity fluids when inserted into the body cavity. Therefore the materials used as suppository bases must impart these properties and also fulfil other formulation requirements. There are a large number of bases used but theobroma oil, glycerogelatin base and polyethylene glycols fulfills the above mentioned requirements. An ideal suppository base should have the following properties.

1. It should be good in appearance

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2. It should melt at body temperature dissolve or disperse in the body cavity fluids

3. It should retain its shape when being handled

4. It should be stable on storage i.e. it should not undergo any physical or chemical change on storage.

5. It should be completely nontoxic and non-irritant to the mucous membrane of the body cavity.

Guggulu kalpanā

Commiphora mukul is the source of *Indian bedellium.* Botanical name is commiphora mukul (hook ex stocks). It is a small tree or shrub of 4-8 ft. height. The ash coloured bark comes off in rough flakes exposing the underbark which also peels off in thin papery rolls. Gum resin is obtained by incision of the bark. Each plant yields about 1.5-2 lb. of the product which is collected in the cold season. It is *Niryāsa* (oily latex) achieved from Indian bedellium. *Guggulu* is an amorphous, translucent, solid adhesive, oleo-gum-resin is produced by the process of gummosis from its plant.

Introduction

From the literary study it can be revealed that the *Guggulu* had been described by the name of *Gulgulu* in vedic period. During *Saṁhitā* period its descriptions are found in *Caraka Saṁhitā, Suśruta saṁhitā, Aṣṭāṅga saṁgraha* and *Aṣṭāṅga hṛdaya.* Most of them contain its various therapeutic uses, only in *Suśruta saṁhitā* it is mentioned that *rasa, guṇa, vīrya, vipāka* and varieties also other than the therapeutic effects and uses to cure various ailments. Many other *Āyurvedic* classics have mentioned various formulations of *Guggulu* for the treatment of various ailments.

The following synonyms of *Guggulu* are mentioned on the basis of its pharmacological actions, physical properties etc.

Guggulu : That which protects from diseases

Palankaṣā : That which reduces the bulk of the body

Mahiṣākṣa : That which is coloured like eyes of a buffalo.

Deva dhūpa : That which is used for the fumigation during worship.

Kauśika : That which occurs in the hollow spaces of the tree.

Pura : That which is the best amongst all medicines.

Kumbha : The exudates come out from the hollow spaces of the tree like that of the empty space of earthern pot.

Ulūkhalaka : That which comes out from the mortar *(Ulukhala)* shaped spaces of the tree.

Marudeśya : That which occurs in *Maru deśa* or sandy region.

Kāla niryāsa : That comes out from the trees during the summer season due to the excessive heat of sun.

Gandharāja : That which is best amongst all aromatic drugs.

Kaṇa gugglu : That which dries in hot atmosphere and converts to small particles.

Swarṇa kaṇa : That which after getting dried in hot atmosphere, converts to small particle form having golden yellow brightness.

Sarsa : That which is sticky in nature after getting moisture.

In *Āyurveda, guggulu* has been used as single or compound drug in the form of pills. Formulations

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which contain *guggulu* as main ingredient, they can be called as *guggulu kalpanā*. Here *guggulu* is used in *Yoga* for both purposes, as a base and as well as medicament also.

Characteristics of the Resin

When the oleo gum resin in fresh, on look at it is golden in colour, there is fragrance in it and it is moist and viscid. It burns in fire, melts in the sun and forms a milky emulsion with water. The resin occurs in pieces, pale yellow or dull green in colour with a bitter aromatic taste and balsamic and feeble odour. The fractured surface resists the finger nail.

Period for collection of Resin

The period for collection of the *Guggulu* resin is summer season, because in summer season due to excessive heat it comes out naturally from the tree through incised barks. It's dropper collection is only possible in winter season. The amount of collection varies from plant to plant. Usually one plant yields about 1.5 to 2 lb. of the product.

Examination of the purity of Guggulu

As regards the purity of the *guggulu,* it should possess it's all specific characteristics. It should be soft, bitter, yellowish, completely devoid of dust and soluble in hot water giving white solution like milk.

Chemical composition of guggulu (Resin of commiphora mukul)

Guggulu mainly contains gum, oleo-resin and free acid. The gum is near about 32%, out of the oleo resins there are two important constituents one is essential oil which is about 1.05%, the second one is resin which is found in two forms one is saponifiable stage and another is unsaponifiable stage. The saponifiable material contains three main chemical constituents :

1. Mycene–64% 2. Dimercene–11%

3. Polymercene–Percentage is not exactly known.

After acid extraction of the unsaponifiabole resin a complex of terpenoid acids are found.

Varieties of Guggulu

There are several varieties of *guggulu* described in *Āyurvedic classics.* In *Caraka saṁhitā, Suśrtua saṁhitā* and *Aṣṭānga saṁgraha* there is no any particular description except the old and new variety of *Guggulu.* The new one is *Snigdha, picchila* in quality, looks like jam fruit, having good flavour and it is *Bṛmhaṇa vṛṣya.*

The old one is dry having foul smell and devoid of its natural colour and *Vīrya* (potency).

Later there are five different varieties of *Guggulu* mentioned. However two of the varieties, namely, *Mahiṣākṣa* and *Kanaka guggulu* usually preferred for medicinal preparations. *Mahiṣākṣa guggulu* is dark greenish brown and *Kanaka guggulu* is yellowish brown in colour.

Pharmacological actions

Rasa : *Tikta, Kaṭu, Madhura, Kaṣāya*

Guṇa : *Laghu, Tīkṣna, Snigdha, Picchila, Sūkṣma, Saṛa*

Vīrya : *Uṣṇa*

Vipāka : *Kaṭu*

Prabhāva : *Tridoṣa śamanam*

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Karma : *Medoharam, Agnimāndyaharam, Śodhaharam, Vedanaharam, Vraṇaśodhanam, Vraṇaropaṇam.*

Āmayika prayoga

Medoroga, Snāyukaṇḍara śodha, sandhiśūla.

Because of *Sūkṣma, laghu, Sara Guṇas* it will provide fast obsorption in body through *Sūkṣma srotas* and because of *Snigdha, Picchila guṇas* it will provide prolonged drug action too.

Uses of guggulu : In *Āyruvedic* classics, *guggulu* is used in the following forms, either as a single drug or as a combination.

1. *Vaṭi-Guṭika* (pills), 2. *Rasa kriya,* 3. *Kwātha,* 4. *Dhūpa,* 5. *Cūrṇa,* 6. *Taila,* 7. *Ghṛta,* 8. *Avaleha,* 9. *Lepa* 10. *Rasayoga,* 11. *Modaka* (combinations with jaggery etc.) 12. *Malahara* and *Pradeha,* 13. *Utkarika* (fried preparation etc.)

In all such preparations, *guggulu* is used only after it's *Śodhana.*

Modern pharmacological aspects of gum guggulu

It is used as demulcent, aperient, carminative and alternative. It is chiefly stated that it can be used in leprosy, rheumatism, syphilis, scrofulous affections, nervous diseases and also in urinary diseases. Ointment preparation from gum resin is used in the treatment of chronic ulcers.

Externally

On the abraded skin and the mucous membrane, it acts as an astringent and antiseptic. It has no action on unbroken skin.

Need for śodhana of guggulu

It is a rasinous matter of a tree (commiphora mukul) exudes from the stem on incision. Being sticky in nature, it gets contaminated with many physical impurities found on the ground nearby the tree, like small pieces of stones, vegetable matters, sand, dust, insects etc. so it is an essential thing to make it free from all these foreign matters before its internal use. After purification guggulu gets such a state, by which guggulu can be moulded easily into pills form by manual as well as by machine too.

Process of Śodhana

Apparatus required

Dola yañtra, cloth, tray etc.

Drugs required

Guggulu-appropriate quantity

Drava dravya

Any one among *Triphala Kaṣāya, Vāsapatra kaṣāya, Vāsapatra Swarasa, Nirguṇḍi patra swarasa* with *Cūrṇa, Godugdha, Gomūtra* can be selected.

Procedure

Market sample of crude *guggulu* resin is collected and the visible macro physical impurities like sand, stones, glass, vegetable parts and insects etc. are removed by picking manually from the *Guggulu* resin. *Guggulu* is then broken into small pieces. It is thereafter bundled in a piece of cloth and the bundle of *guggulu* is kept immersed in the liquid, then boiled in *Dola yañtra* containing any one of the following liquids.

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1. *Triphala kaṣāya,* 2. *Vāsapatra kaṣāya,* 3. *Vāsapatra swarasa,* 4. *Nirguṇḍipatra swarasa* with *haridracūrṇa*, 5. *Godugdha,* 6. *Gomūtra.*

Boiling is done in constant slow heat and the boiling of *Guggulu* in *Dola yañtra* is continued until all the *guggulu* passes into the liquid through the cloth.

The *poṭṭalī* (bundle) should be very often used to be rubbed so as to squeeze out the soluble *guggulu* from the cloth. The residue containing impurities in the bundle is discarded. The obtained liquid is filtered through a cloth and allowed to stand for some time, so that the heavy micro sand particles etc. may get settled down. Then the supernatant part of the fluid is decanted in another pot leaving behind the impurities like sand and dust etc. in the bottom of the pot. The supernatant part of the fluid is again boiled to evaporate its water content, till it forms a mass. This semisolid mass is taken in an enamel tray and is dried under sun. While drying it should be protected from the dust and other contaminants from the surroundings. This dried *guggulu* is poured in a stone mortar and ground with pestle adding ghee in small quantities till it becomes waxy type material. This end product is called *Śodhita guggulu.*

Śāraṅgadharās commentator, *kāśirāma,* in his *Gūḍhārtha Dipikā* mentions that *Guggulu* should be dissolved in any *Vātahara warm kaṣāya* and then dried. It should be pounded *(Kuṭṭanam)* with ghee it becomes waxy. This is possible in 24 hours.

The other method is that, sand, stone etc. which are common impurities are first removed and then broken into small pieces. Thereafter it is, tied in a piece of cloth and boiled in *Dola yañtra* containing above mentioned *drava dravyas*. The boiling is continued till *guggulu* becomes a soft mass. It then taken out of the cloth and spread over a smooth wooden board smeared with ghee or oil. By pressing with finger the sand and other remaining foreign impurities are removed. It is taken out and dried in a place free from dust. These bits are again fried with ghee and ground in a *Khalva yañtra.* This end product is called *Śodhita guggulu.*

There is also another practice of steaming the *guggulu* in vapour by suspending it in the *Dolā yañtra* without actually immersing it in water.

Precaution to be taken during the *Śodhana :*

1. Heat should be mild within the range of 60^0-70^0C, so that the content of the drug may not be spoiled.

2. *Poṭṭalī* (bundle) should be immersed totally within the *drava dravya* of *dala yañtra.*

3. Rubbing of the *poṭṭalī* should be mild and constant, it should not be vigorous otherwise, the cloth of the *poṭṭalī* will be braked and the contaminants may mixed in the filtered material.

4. Constant stirring should be done to avoid *guggulu* sticking and burning at the bottom of the pot.

Characteristics : *Śodhita guggulu* is soft, waxy and blackish brown in colour (milky white on dissolution). Smell is aromatic in odour and sticky in nature.

Preservation : Thus purified *guggulu* is kept in glass or porcelain jars which are free from the moisture.

Mātra : *Mātra* of *Śodhit guggulu*–4-12 *ratī* (480-1440 mg.)

Restrictions to be followed during the treatment with Guggulu

One should avoid *Āmla, Tīkṣṇa, Ajīrnakara Āhara, Madya Pāna,* sexual itercourse, physical exercise, exposure to heat of the sun, emotions like anger during the treatment with *guggulu.*

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Guggulu yoga preparation

By doing *Guggulu kalpanā,* active principles of the mixed drug powders remain for prolonged time, at the same time therapeutic value of *Guggulu* also will be provided to the patients.

Apparatus required

Mortar and pestle

Drugs required

Śodhita guggulu	:	1 part
Dravya Cūrṇa	:	1 part

Method or preparation

The *Sūkṣma cūrṇa* (fine powder) of mentioned drugs and *Śodhita guggulu* powder should be taken in equal quantity.

Procedure

No. 1 : *Guggulu Vaṭī* can be prepared by making *Pāka* with water and mixing with respected drug powders. The water should be taken in appropriate quantity to get *Pāka.* The drug powder has to be mixed at one particular place of *guggulu pāka* i.e. *guggulu* with water has to be boiled till it attains equal characters of *guḍa pāka* and this *pāka* should be in concentrated form and it should sink in the water (it should be in concentrated form and it should sink in the water (it should not dissolve in water and having stability). When little quantity of *guggulu pāka* tested in water which is collected in container. During that state of *Guggulu pāka* medicinal drug powders has to be mixed little by little by doing continuous stirring and contents are rolled into *vaṭī* form (similarity of both *guggulu pāka* and *guḍa pāka* is mentioned only for the *pāka* state only. But after the preparation of *guggulu vaṭī,* it will have hard consistency, where as *guḍa pāka* will have soft consistency). While making *guggulu guṭika* little amount of *ghṛta* has to be applied to hands and for the tray so that, it wont stick to the hands as well as tray while drying.

No. 2 : *Guggulu Vaṭī* can be prepared directly without making *pāka, śodhita guggulu* and *auṣadha dravya sūkṣma cūrṇa* (fine powder) has to be mixed by doing trituration uniformly and molded into *vaṭi* form. More time trituration will produce more efficacious form of *guggulu guṭika.* The *Ghṛta* has to be added till the content reaches semisolid state by which *vaṭi* can moulded easily. These are draid in shade.

As per our tradition a reference available by Kanshi Ram the commentator of *Śārṅgadhara Saṁhitā* advocates the processing of *Guggulu Vaṭi* by hammering along with Ghee to make the pills good and shining.

No. 3 : Due to the advancement of the Pharmaceutical Processing *Āyurvedic* trends are getting modified and are being given such a shape which may be able to maintain the standard of the dose and quantity. For this purpose modern Pharmaceutical concerns are processing the *guggulu* in the form of tablet. For this purpose the ingredients (According to yoga) are taken in powder form and moistened with the granulating agent (Solution of gum of acacia) using sufficient quantity. The coherent material is then passed through a sieve (No. 10). The shifted material which is now in the form of granules, is dried thoroughly by spreading on enamel trays in thin layers and kept in an oven at a temperature not exceeding 60°C. After drying, the granules are then passed though a finer sieve (NO. 20) and any fine

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powder rejected. Now the compression of the granules in to tablets is carried out by means of a tablet machine which stamps out the tablets in a die between punches.

Colour and other characteristics of *Guggulu Kalpanā* vary from preparation to preparation depending upon the ingredients added to the formulae.

Mātra : 50 mgs to 500 mgs

Visiṣṭa Yogas

Yogarāja guggulu, Siṁhanāda guggulu, Trayodaśānga guggulu, Triphalā guggulu, Lākṣādi guggulu, Vātāri guggulu and Gokṣūrādi guggulu etc.

Preservation and storage

It should be kept in glass or porcelain jars, which are free from moisture and heat.

Expiry period

The potency is maintained for two years when prepared with vegetable ingredients and indefinitely when prepared with metals and minerals.

Gokṣūrādi Guggulu

अष्टाविंशतिसंख्यानि पलान्यानीय गोक्षुरात् । विपचेत्षड्गुणे नीरे क्वाथो ग्राह्योऽर्धशेषितः ।।
ततः पुनः पचेत्तत्र पुरं सप्तपलं क्षिपेत् । त्रिकटु त्रिफला मुस्तं चूर्णितं पलसप्तकम् ।।
ततः पिण्डीकृतस्यास्य गुटिका मुखयोजिता ।। (शा.सं.,म.ख.अ. ७,८४-८६)

Ingredients

1.	*Gokṣūra*	*854 gm*
2.	*Śuddha Guggulu*	*213.5 gm*
3.	*Śuṇṭhi*	*30.5 gm*
4.	*Marica*	*30.5 gm*
5.	*Pippali*	*30.5 gm*
6.	*Haritaki*	*30.5 gm*
7.	*Vibhitaki*	*30.5 gm*
8.	*Āmalaki*	*30.5 gm*
9.	*Musta*	*30.5 gm*
10.	*Ghee*	*20 gm*

Method of Preparation

Kaṣāya of *gokṣūra* is prepared, after making its *kwātha cūrṇa. Guggulu* is added to the filtered *kaṣāya,* which is boiled again to *rasakriya pāka.* Then vessel is taken out from the fire and fine powder of remaining drugs is added and mixed well.

Dose : 1 to 3 gm

Anupāna : *Musta Kwātha, Pāṣāṇabheda Kwātha, Uśira Kwātha.*

Therapeutic Uses

Prameha, Mūtra Kncchra, Aśmari, Pradara.

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Kāñcanāra Guggulu

कांचनारत्वचो ग्राह्यं पलानां दशकं बुधैः ।। त्रिफला षट्पला कार्या त्रिकटु स्यात्पलत्रयम् ।
पलैकं वरुणं कुर्यादिलात्वक्पत्रकं तथा ।। एकैकं कर्षमात्रां स्यात्सर्वाण्येकत्रा चूर्णयेत् ।
यावच्चूर्णमिदं एवं तावन्मात्रस्तु गुग्गुलुः ।। संकुट्य सर्वमेकत्र पिण्डं कृत्वा च धारयेत् ।
गुटिका शाणमात्रेण प्रातर्ग्राह्या यथोचितम् ।। (शा.सं.म.ख. ७/९५-९८)

Ingredients

1. *Kāñcanāra Twak* : *123.4 gm*
2. *Haritaki* : *24.68 gm*
3. *Vibhitaki* : *24.68 gm*
4. *Āmalaki* : *24.68 gm*
5. *Śuṇṭhi* : *12.34 gm*
6. *Marica* : *12.34 gm*
7. *Pippali* : *12.34 gm*
8. *Varuṇa* : *12.34 gm*
9. *Ela (Sukṣmaela)* : *3.08 gm*
10. *Twak* : *3.08 gm*
11. *Patra* : *3.08 gm*
12. *Guggulu (Śuddha)* : *256.06 gm*

Method of preparation

Drugs no.1 to no.11 are made in to fine powder form. Then powder of this *prakṣepa cūrṇa* is mixed with *guggulu pāka,* and contents are mixed well with hands, then material is converted into pill form.

Dose : 1 to 3 gm, as directed by the Physician.

Anupāna : *Muṇḍi kwātha, Khadira Sara Kwātha, Haritaki Kwātha, Uṣṇa jala.*

Therapeutic Uses

Gulma, Gaṇḍamala, Apaci, Arbuda, Granthi, Vraṇa, Kuṣṭha, Bhagandara, Slipada.

Kaiṣora guggulu

त्रिफलायास्त्रयः प्रस्थाः प्रस्थैका चामृता भवेत् ।। संकुट्य लोहपात्रेण सार्धद्रोणाम्बुना पचेत् ।
जलमर्धशृतं ज्ञात्वा गृह्णीयाद्वस्त्रगालितम् ।। ततः क्वाथे क्षिपेच्छुध्दं गुग्गुलः प्रस्थसंमितम् ।
पुनः पचेदयःपात्रे दर्व्या संघर्षयेन्मुहुः ।। सान्द्रीभूतं ततो ज्ञात्वा गुडपाकसमाकृतिम् ।
चूर्णीकृत्य ततस्तत्र द्रव्याणीमानि निक्षिपेत् ।। त्रिफला द्विपला ज्ञेया गुडूची पलिका मता ।
षडक्षं त्र्यूषणं प्रोक्तं विडङ्गानां पलार्धकम् ।। दन्ती कर्षमिता कार्या त्रिवृत्कर्षमिता स्मृता ।
ततः पिण्डीकृतं सर्वं घृतपात्रे विनिक्षिपेत् ।। गुटिकाः शाणमात्रेण युञ्जयाद्दोषाद्यपेक्षया ।
अनुपाने भिषग्दद्यात्कोष्णं नीरं पयोऽथवा ।। मञ्जिष्ठादिशृतं वापि युक्तियुक्तमुतापरम् ।
जयेत्सर्वाणि कुष्ठानि वातरक्तं त्रिदोषजम् ।। सर्वव्रणानि गुल्मानि प्रमेहपिडिकास्तथा ।
प्रमेहोदरमन्दाग्निकासश्वयथुपाण्डुजान् ।। हन्ति सर्वामयान्नित्यमुपयुक्तो रसायनः ।

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कैशोरकाभिधानोऽयं गुग्गुलुः कान्तिकारकः ।। वासादिना नेत्रगदान्गुल्मादीन्वरुणादिना ।
क्वाथेन खदिरस्यापि व्रणकुष्ठानि नाशयेत् ।। अम्लं तीक्ष्णमजीर्णं च व्यायामं श्रममातपम् ।
मद्यं रोषं त्यजेत्सम्यग्गुणार्थी पुरसेवकः ।। (शा. सं. म. ख. ७.७०-८१)

Apparatus required

Khalva yantra, Loha pātra, cloth, iron laddle, pot etc.

Drugs required

Triphalā yavakuṭa cūrṇa	:	3 *prasthās* (2304 gms)
Guḍūci yavakūṭa cūrṇa	:	1 *prastha* (768 gms)
Water for *kwātha*	:	$1^1/_2$ *droṇas* (18 kg. 432 gms)
Śodhita guggulu cūrṇa	:	1 *prastha* (168 gms)
Triphalā sūkṣma cūrṇa	:	2 *pala* (96 gms)
Viḍaṅga	:	1 *pala* (48 gms)
Dantī sūkṣma cūrṇa	:	1 *karṣa* (12 gms)
Tṛvṛt sūkṣma cūrṇa	:	1 *karṣa* (12 gms)
Ghṛta	:	Appropriate quantity

Procedure

Three *prasthās* of *Triphalā yavakuṭa cūrṇa,* one *prastha* of *guḍūci yavakūṭa cūrṇa* are to be boiled in a *loha pātra* (iron vessel) with one and half *droṇas* of water. Then total quantity is reduced to half and filtered through cloth. This *kwātha* is again collected into same *loha pātra* and one *prasthā* of *śodhita guggulu* is added to the *kwātha* and heated over *mandāgni,* stirring all the while with iron laddle. When the mass begins to solidify (raches proper *pāka*), the fine powder of the following drugs (two *palas* of *triphalā,* one *pala* of *viḍanga,* one *karṣa* each of *dantī* and *tṛivṛt*) are added and mixed well informally. The mass is then transferred to a pot containing a little quantity of *Ghṛta* and when mass becomes slightly cold state. Then it should be rolled into pills of on *Ṣāṇa* each. This recipe known as *Kaiṣora guggulu.*

Anupāna : Warm water, milk, *manjiṣṭādi kwātha* etc.

Karma : If used daily, acts as *Rasāyana, Kānti varḍhakam* (imparts good lusture to the skin).

Āmayika Prayoga

Kuṣṭa, tridoṣaja vāta rakta, vraṇa, gulma, prameha piḍaka, prameha, udara, mandāgni, kāsa, śotha of *pāṇḍuroga* and all other diseases.

With *vāsādi kwātha* it is beneficial in diseases of the eye, with *varuṇādi kwātha* in *gulma,* with *khadirādi kwātha* in cases of *vraṇa* and *kuṣṭa.*

Apathya

During treatment the patient should avoid indigestion, foods which are sour and hot, sexual intercourse, physical exertion, exposure to sun, alcoholic drinks and anger.

Kaiṣora guggulu

वरमहिषलोचनोदरसन्निभवर्णस्य गुग्गुलोः प्रस्थम् । प्रक्षिप्य तोयराशौ त्रिफलाञ्च यथोक्तपरिमाणाम् ।।
द्वात्रिंशच्छिन्नरुहापलानि देयानि यत्नेन । विपचेत्तदप्रमत्तो दर्व्या संघट्टयन मुहुर्यावत् ।।

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अर्धक्षयितं तोयं जातं ज्वलनस्य सम्पर्कात् । अवतार्य वस्त्रपूतं पुनरपि संसाधयेदयःपात्र ।।
सान्द्रीभूते तस्मिन्नवतार्य हिमोपलप्रख्ये । त्रिफलाचूर्णार्धपलं त्रिकटोश्चूर्णं षडक्षपरिमाणम् ।।
कृमिरिपुचूर्णार्धपलंकषं कर्षं त्रिवद्दन्त्योः । अमृतायाः पलमेकं सर्पिश्च पलाष्टकं क्षिपेदमलम् ।।
(भै. र. वातरक्ताधिकार ९७/१०१)

Ingredients

1.	*Guggulu*	*352 gm*	9.	*Śunthi*	*11 gm*
2.	*Haritaki*	*117.5 gm*	10.	*Marica*	*11 gm*
3.	*Vibhitaki*	*117.5 gm*	11.	*Pippāli*	*11 gm*
4.	*Āmalaki*	*117.5 gm*	12.	*Kṛmiripu*	*11 gm*
5.	*Guḍūci*	*704 gm*	13.	*Trivṛt*	*5.5 gm*
6.	*Haritaki*	*3.75 gm*	14.	*Danti*	*5.5 gm*
7.	*Vibhitaki*	*3.75 gm*	15.	*Amruta*	*22 gm*
8.	*Āmalaki*	*3.75 gm*	16.	*Ghṛta*	*25 gm*

Method of preparation

Kaṣāya of No.2 to 5 is prepared. *Guggulu* is added to the filtered *kaṣāya,* which is boiled again to *pāka.* Fine powder of remaining drugs are added and mixed well. Then material is made into pills form.

Dose : 3 gm

Anupāna : *Mudga, Yuṣa, Kṣīra, Sugandhajala*

Therapeutic uses

Mandāgni, Vibandha, Vatasoṇita, Pramehapiḍaka.

Simhanādha Guggulu

पलत्रयं कषायस्य त्रिफलायाः सुचूर्णितम् । सौगन्धिकपलञ्चैकं कोशिकस्य पलं तथा ।।
कुडवं चित्रतैलस्य सर्वमादाय यत्नतः । पाचयेत्पाकविद्वैद्यः पात्रे लौहमये दृढे ।।
हन्ति वातं तथा पित्तं श्लेष्माणं खञ्जपङ्गुतकाम् । श्वासं सुदुर्जयं हन्ति कासं पञ्चविधं तथा ।।
कुष्ठानि वातरक्तानि गुल्मशूलोदराणि च । आमवातं जयेदेतदपि वैद्यविवर्जितम् ।।
एतदभ्यासयोगेन जरापलितनाशनम् । सर्पिस्तैलरसोपेतमश्नीयाच्छालिषष्टिकम् ।।
सिंहनाद इति ख्यातो रोगवारणदर्पहा । वह्निवृद्धिकरः पुंसां भाषितो दण्डपाणिना ।।
(चक्रदंतः, आमवाते अ. १५.३३-३.८)

Apparatus required

Khalva yañtra, cloth, *loha pātra,* laddle

Drugs required

Āmalaki	:	50 gms
Harītaki	:	50 gms
Bibhītaki	:	50 gms
Śodhita gandhaka	:	50 gms
Śodhita guggulu	:	50 gms

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Eranda taila	:	200 ml
Water	:	Appropriate quantity

Procedure

Triphalā is made into *yavakūṭa cūrṇa* and its *kwātha* is prepared. This *kwātha* is taken into *loha pātra* and *śodhita guggulu* is added and boiled over *mandāgni.* While heating contents are stirred properly, when *guggulu* completely get dissolved in *Triphalā kwātha* then *Gandhaka cūrṇa* and *Eraṇḍa taila* are added little by little and mixed well. When it attains proper *Pāka* taken out from fire and rolled into pills and preserved in glass container.

Karma : *Rasāyana*

Āmayika prayoga

Vāta, Pitta and *Kaphaja vikāra, Khanja, Pāṇḍu, Śwāsa,* five varieties of *Kāsa, Kuṣṭa, Vāta-rakta, Gulma, Śūla, Udararoga,* severe pain of *Āmavata.*

Pathya during its administration

Ghṛta, taila, śālidhānya, māṁsa rasa.

Simhanādha Guggulu

पलत्रयं कषायस्य त्रिफलायाः सुचूर्णितम् । सौगन्धिकपलञ्चैकं कौशिकस्य पलन्तथा ।।
कुडवं चित्रतैलस्य सर्वमादाय यत्नतः। पाचयेत्पाकविद्वैद्यः पात्रे लोहमये दृढे ।।

(भै. र. आमवाताधिकार १३०)

Ingredients

1. Harītaki	:	*100 gm*
2. Vibhitaki	:	*100 gm*
3. Āmalaki	:	*100 gm*
5. Śuddha Gandhaka	:	*100 gm*
6. Śuddha Guggulu	:	*100 gm*
7. Eraṇḍa Taila	:	*50 gm*

Method of Preparation

Kaṣāya of drugs No.1 to 3 is prepared in an iron vessel. *Eraṇḍa Taila* is added to the *kaṣāya* and boiled. When the liquid is get concentrated *gandhaka* and *guggulu* are added and mixed well till it gets the consistence for making pills.

Dose : 3gm

Anupāna : *Uṣṇa Jala, Rāsnairaṇḍādi Kwātha, Rāsnādi Kwātha.*

Therapeutic Uses

Khanja, Pangu, Āmavāta, Vātarakta, Kuṣṭa.

Trayodasanga Guggulu

Ingredients

1. Babbula twak	:	*20 gm*
2. Aśwagandha	:	*20 gm*

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3. *Hapuṣa* : 20 gm
4. *Guḍūci* : 20 gm
5. *Śatāvari* : 20 gm
6. *Gokṣūra* : 20 gm
7. *Vṛddhadaru* : 20 gm
8. *Rāsna* : 20 gm
9. *Śatāhva* : 20 gm
10. *Ṣaṭi* : 20 gm
11. *Yamāni* : 20 gm
12. *Śuṇṭhi* : 20 gm
13. *Guggulu (Śuddha)* : 240 gm
14. *Ghṛta* : 20 gm

Method of preparation

Fine powder of drugs No.1 to No.12 are added to the *guggulu pāka* (*guggulu pāka* is made by boiling the *guggulu* with appropriate quantity of water) and mixed uniformly. Then *ghṛta* is added and pounded well till the whole thing become a soft mass.

Dose : 1 to 3 gm

Anupāna : *Br.Saindavādya Taila, Triphala Kwātha, Madhu*, and *Lasuna Swarasa.*

Therapeutic uses

Kaṭigraha, Gṛdrasi, Hanugraha, Bāhuśūla.

Triphalā Guggulu

त्रिपलं त्रिफलाचूर्णं कृष्णाचूर्णं पलोन्मितम्। गुग्गुलुं पाञ्चपलिकं क्षोदयेत्सर्वमेकतः ।।
ततस्तु गुटिकां कृत्वा प्रयुञ्जयाद्वह्न्यपेक्षया। भगन्दरं गुल्मशोथावर्शांसि च विनाशयेत् ।।
(शा. सं. म. ख. ७.८२-८३)

Apparatus required

Vessel, Khalva yañtra, cloth etc.

Drugs required

Triphalā cūrṇa	:	3 palas (144 gms)
Pippali cūrṇa	:	1 pala (48 gms)
Śodhita guggulu cūrṇa	:	5 palas (240 gms)
Water	:	Appropriate quantity
Ghṛta	:	Appropriate quantity

Procedure

No. 1. *Śodhita guggulu* is taken in a vessel and added little amount of hot water and heated over fire with *Madyamāgni* when total *Guggulu* is completely dissolved in water rest of *Dravya cūrṇa* mixture (4 drugs powder) is added little by little and stirred continuously till the contents are uniformly mixed and then contents are collected into *Khalva yantra* and grinded well, then this substance is rolled

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into pills having weight of 6 *rattis* to 8 *rattis* and dried in shade, then preserved in air tight glass or plastic containers. This recipe is known as *Triphalā guggulu.*

No. 2. : There is another method is also practiced for the preparation of *triphalā guggulu* likewise : fine powder of *triphalā* and *pippali* is mixed with *Śodhita guggulu cūrṇa* in a *khalva yañtra* and made into paste form by adding appropriate quantity of *ghṛta* (little amount) and grinded well. Then it is rolled into pills.

Mātra : 1 to 2 *Guṭikā* per day

Anupāna : *Uṣnodaka* and any *Vraṇaropaka dravya kwātha*

Āmayika prayoga

Bhagandara, gulma, śotha, arśa

Yogarāja guggulu

नागरं पिप्पली चव्यं पिप्पलीमूलचित्रकौ ।। भृष्टं हिङ्ग्वजमोदा च सर्षपो जीरकद्वयम् ।
रेणुकेन्द्रयवाः पाठा विडङ्गं गजपिप्पली ।। कटुकातिविषा भार्ङ्गी वचामूर्वे त्रिभागतः ।
प्रत्येकं शाणकानि स्युर्द्रव्याणीमानि विंशतिः ।। द्रव्येभ्यः सकलेभ्यश्च त्रिफला द्विगुणा भवेत् ।
एभिश्चूर्णीकृतैः सर्वैः समो देयश्च गुग्गुलुः ।। वङ्गं रौप्यं च नागं च लोहसारस्तथाभ्रकम् ।
मण्डूरं रससिन्दूरं प्रत्येकं पलसंमितम् ।। गुडपाकसमं कृत्वा इमं दद्याद्यथोचितम् ।
एकपिण्डं ततः कृत्वा धारयेद्घृतभाजने ।। गुटिकाः शाणमात्रास्तु कृत्वा ग्राह्या यथोचिताः ।
गुग्गुलुर्योगराजोऽयं त्रिदोषघ्नो रसायनः ।। मैथुनाहारपानानां त्यागो नैवात्र विद्यते ।
सर्वान्वातामयान्कुष्ठानर्शांसि ग्रहणीगदम् ।। प्रमेहं वातरक्तं च नाभशूलं भगन्दरम् ।
उदावर्तं क्षयं गुल्ममपस्मारमुरोग्रहम् ।। मन्दाग्निं श्वासकासं च नाशयेदरुचिं तथा ।
रेतोदोषहरः पुंसां रजोदोषहरः स्त्रियाम् ।। पुंसामपत्यजनको बन्ध्यानां गर्भदस्तथा ।
रास्नादिक्वाथसंयुक्तो विविधं हन्ति मारुतम् ।। काङ्कोल्यादिशृतात्पित्तं कफमारग्वधादिना ।
दार्वीशृतेन मेहांश्च गोमूत्रेण च पाण्डुताम् ।। मेदोवृद्धिं च मधुना कुष्ठं निम्बशृतेन च ।
छिन्नाक्वाथेन वातास्रं शोथं शूलं कणाशृतात् ।। पाटलाक्वाथसहितो विषं मूकजं जयेत् ।
त्रिफलाक्वाथसहितो नेत्रार्तिं हन्ति दारुणाम् ।। पुनर्नवादिक्वाथेन हन्यात्सर्वोदराण्यपि ।

(शा.सं.म.ख. ७. ५६-६९)

Apparatus required

Khalva yañtra, cloth, vessel, laddle, pot etc.

Drugs required

Nāgara	:	1 *Ṣāṇa* (4 gms)
Pippalī	:	1 *Ṣāṇa* (4 gms)
Cavya	:	1 *Ṣāṇa* (4 gms)
Pippalīmūla	:	1 *Ṣāṇa* (4 gms)
Citrakamūla	:	1 *Ṣāṇa* (4 gms)
Bharjita hingu	:	1 *Ṣāṇa* (4 gms)
Ajamoda	:	1 *Ṣāṇa* (4 gms)
Sarṣapa	:	1 *Ṣāṇa* (4 gms)

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Kṛṣnajīraka	:	1 *Ṣāṇa* (4 gms)
Śweta jīraka	:	1 *Ṣāṇa* (4 gms)
Renuka	:	1 *Ṣāṇa* (4 gms)
Indrayava	:	1 *Ṣāṇa* (4 gms)
Pāṭā	:	1 *Ṣāṇa* (4 gms)
Viḍaṇga	:	1 *Ṣāṇa* (4 gms)
Gajapippalī	:	1 *Ṣāṇa* (4 gms)
Kaṭuka	:	1 *Ṣāṇa* (4 gms)
Ativiṣā	:	1 *Ṣāṇa* (4 gms)
Bhārangī	:	1 *Ṣāṇa* (4 gms)
Vacā	:	1 *Ṣāṇa* (4 gms)
Mūrvā	:	1 *Ṣāṇa* (4 gms)
Triphalā	:	40 *Ṣāṇa* (160 gms)
Śodhita guggulu	:	60 *Ṣāṇa* (240 gms)
Ghṛta	:	Appropriate quantity
Vanga bhasma	:	1 pala (48 gms)
Roupya bhasma	:	1 pala (48 gms)
Nāga bhasma	:	1 pala (48 gms)
Abhraka bhasma	:	1 pala (48 gms)
Maṇḍūra bhasma	:	1 pala (48 gms)
Rasasiṇḍhūra	:	1 pala (48 gms)

Procedure

Nāgara to mūrvā–these twenty drugs (fine powder form) each one *Ṣāṇa, Triphala* (fine powder form) double the total quantity and *Guggulu* equal to the total of all are taken, nicely powdered, put in a pot containing a little quantity of ghee, cooked well and rolled into pills of one *Ṣāṇa* in quantity.

Nāgara to *Mūrvā* (these twenty drugs each one *Sāṇa, Triphala* double the quantity (40 *Sāṇa*) are made into *Sūkṣma cūrṇa* (fine powder form) and mixed together and kept ready. *Śodhita guggulu* (60 *Sāṇa*) is taken into *Khalva yañtra,* little quantity of *ghṛta* is added and grinded well till contents attains proper *pāka* (similar to the *guḍa pāka*), then above mentioned drugs powder is added little by little and mixed uniformely by grinding. Then *vangabhasma, roupyabhasma, nāgabhasma, abhrakabhasma, maṇḍūrabhasma, rasa sindhura* each one *pala pramāṇa* is added and grinded, then mixed uniformly. This substance is made into *guṭikas* having 1 *ṣāṇa pramāṇa* and preserved in ghee coated earthen pot and whenever required *guṭika* are taken out from pot. This recipe known as *Yogarāja guggulu.*

Karma : *Tridoṣaharam, vāta haram, rasāyana,* makes men fertile and barren women to become pregnant.

Avoidance of sex, food and drinks are not necessary.

Āmayika prayoga

All types of *Vātavyādhis, kuṣṭha, arśa, prameha, vātarakta, nābhi śūla, bhagandara, gulma, apasmāra, urograha, mandāgni, śwāsakāsa, aruci,* seminal disorders in men and menstrual disorders in women.

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Anupāna : Taken with *rāsanādi kwātha* it cures all *vāta* disorders, with *kankolyādi kwātha, pitta* disorders and *kapha* disorders with *aragwadhādi kwātha, pāṇḍu-roga* with cow's urine, *medovṛddhi* with honey, *kuṣṭha* with *nimba kwātha, vātarakta* with *amṛtavalli kwātha, śotha* and *śūla* with *kaṇā kwātha, mūṣaka viṣa* (poisoning by rate bite) with *pāṭalā kwātha,* eye diseases with *triphalā kwātha* and all types of *udara* with *punarnavā kwātha.*

Yogaraja Guggulu

चित्रकं पिप्लीमूलं यमानी कारवी तथा। विडंगान्यजमोदा च जीरके सुरदारु च ।।
चव्येला सैन्धवं कुष्ठं रास्नागोक्षुरधान्यकम्। त्रिफला मुस्तकं व्योषं त्वगुशीरं यवाग्रजम् ।।
तालीशपत्रं पत्रञ्च श्लक्ष्णचूर्णानि कारयेत् । यावन्त्येतानि चूर्णानि तावन्मात्रन्तु गुग्गुलुम् ।।
सम्मर्द्य सर्पिषा गाढं स्निग्धे भाण्डे निधापयेत् । अतो मात्रां प्रयुञ्जीत यथेष्टाहारवानपि ।।

(भै. र. आमवाताधिकार ९०/९३)

Ingredients

1.	*Citraka*	*9.5 gm*	14.	*Dhānyaka*	*9.5 gm*
2.	*Pippalimūla*	*9.5 gm*	15.	*Haritaki*	*9.5 gm*
3.	*Yavāni (Ajmoda)*	*19 gm*	16.	*Vibhitaki*	*9.5 gm*
4.	*Kṛṣṇa jiraka*	*9.5 gm*	17.	*Āmalaki*	*9.5 gm*
5.	*Viḍanga*	*9.5 gm*	18.	*Mustaka*	*9.5 gm*
6.	*Jiraka (Śwetajiraka)*	*9.5 gm*	19.	*Śuṇṭhi*	*9.5 gm*
7.	*Devadāru*	*9.5 gm*	20.	*Marica*	*9.5 gm*
8.	*Cavya*	*9.5 gm*	21.	*Pippali*	*9.5 gm*
9.	*Ela*	*9.5 gm*	22.	*Twak*	*9.5 gm*
10.	*Saindhava lavaṇa*	*9.5 gm*	23.	*Uśira*	*9.5 gm*
11.	*Kuṣṭha*	*9.5 gm*	24.	*Yava Kṣāra*	*9.5 gm*
12.	*Rāsna*	*9.5 gm*	25.	*Talisa patra*	*9.5 gm*
13.	*Gokṣūra*	*9.5 gm*	26.	*Guggulu (Śuddha)*	*250 gm*
			27.	*Ghṛta*	*5 gm*

Method of preparation

Drugs no. 1to 25 are made into fine powder form and added to *guggulu pāka* and mixed well (*ghṛta* is added according to requirement.) When contents are become in to softmass, then it is made in to pills.

Dose : 3 gm

Anupāna : *Rasnasaptaka Kwātha, Lasuna Swarasa, Madhu*

Therapeutic Uses

Udara Roga, Āmavāta, Ādhyavāta.

Yogarāja Guggulu Rasāyan

नागरं पिप्पलीमूलं पिप्पली चव्यचित्रकौ। भृष्ट हिङ्गवजमोदा च सर्षपो जीरकद्वयम्।।
रेणुकेन्द्रयवाः पाठा विडङ्ग गजपिप्पली। कटुकाऽतिविषा भार्ङ्गी वचा मूर्वेति भागतः।।
प्रत्येकं शाणिकानि स्युर्द्रव्याणीमानि विशतिः। द्रव्येभ्यः सकलेभ्यञ्च त्रिफला द्विगुणा भवेत्।

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एभिश्चूर्णीकृतैः सर्वैः समो देयञ्जगुग्गुलुः वङ्गं रौप्यं च नागं च लौहसारस्तथाऽभ्रकम्।।
गुडपाकसमं कृत्वा दद्यादेतं यथोचितम्। एकं पिण्डं ततः कृत्वा धारयेद् घृतभाजने।
गुडिकाः शाणमात्रस्तु कृत्वा ग्राह्या यथोचिताः। गुग्गुलुर्योगराजो त्रिदोषघ्नों रसायनः।।
मैथुनाहारपानानां त्योगो नैवात्र विद्यते। सर्वान् वातामयान् कुष्ठानर्शांसि ग्रहणीगदम्।।
प्रमेहं वातरक्तं च नाभिशूलं भगन्दरम्। उदावर्त्तं क्षयं गुल्ममपस्मारमुरोग्रहम्।
रेतोदोषहरः पुंसां रजोदोषहरः स्त्रियाः। पुंसामपत्यजनको बन्ध्यानां गर्भदस्तथा।
रास्नादिकासिंयुक्तो विविधं हन्ति मारूतम्। काकोल्धादिश्रृतात्पितं कफमारग्वधादिना।
दार्वीश्रृतेन मेहांञ्च गोमूत्रंण च पाण्डुताम्। मेदाऋतिं च मधुना कुष्ठं निम्बश्रृतेन था।
छिन्नक्काथेन वातास्त्रं शोथं शूलं कणाश्रृतात्। पाटलाक्वाथसहितो विषं सूषकजं जयेत्।।
त्रिफलाक्कासिहितो नेत्रार्ति हन्ति दारूणामृ। पुनर्नवादिक्वाथेन हन्ति सर्वोदराण्यपि।।

(शा. सं. १०२-११५/भै. रा. प. ३८२)

Ingradients

1. Śuṇṭhi, 2. Pippalimūla, 3. Pippali, 4. Cavya, 5. Citraka, 6. Bharjita Hiṅgu, 7. Ajamoda, 8. Sarśpa, 9. Syahajiraka, 10. Śweta Jiraka, 11. Reṇuka, 12. Indrayava, 13. Pāṭha, 14. Vāyuviḍanga, 15. Gajapippali, 16. Kuṭuki, 17. Atis, 18. Bhṛngarāj, 19. Vaca, 20. Mūrva, 21. Triphala, 22. Guggulu, 23. Vaṅgabhasma, 24. Rajatabhasma, 25. Nāgabhasma, 26. Lohabhasma, 27. Abhrakabhasma, 28. Maṇḍur bhasma, 29. Rasasindhūra

Dose : 4-6 Ratti

Therapeutic uses

Kuṣṭa, Arśa, Grahaṇi, Prameha, Vātarakta, Nābhiśūla, Bhagandara. Udāvārta, Kṣaya, Gulmā, Apaśmāra, Mandāgni, Śwāsa, Kāsa, Arucī.

Lavaṇa Kalpanā

Lavaṇa Kalpanā is one of useful pharmaceutical preparation in *Āyurveda.*

Procedure

No. 1 : *Saindhava lavaṇa* is powdered and combined with *arka patra, nārikela* etc., and *pāka* is made over agni, finally black colour *lavaṇa* is produced and called as *lavaṇa kalpanā* (preparation of *sauvarcha lavaṇa* also considered one type of *lavaṇa kalpanā* because it is also prepared by heating with agni)

Lavaṇa kalpanā also can be prepared with *eraṇḍa,citraka, karanja,vāsa patra, pāribhadratwak, palāśa kāṣṭa* etc.

Āmayika prayoga

Śūla, gulma, yakrut plīha vikāra, udara vikara,

Arka lavaṇa

सुचिर्णितं सैन्धवन्तु समार्कदलसंयुतम्। अन्तर्धूमं पचेद्धीमान् स्वाङ्गशीतमथोद्धरेत्।।
जायते खल्वसम्पिष्टं लवणं कज्जलप्रभम्। आयुर्वेदाचार्यव्यर्यैर्नाम्नार्कलवणं मतम्।।
यकृत्प्लीहोदरहरं रुचिरं मलभेदनम्। विशेषतः समाख्यातं तन्त्रेऽर्कलवणं बुधैः।।

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माषाकार्धमितं त्वर्कलवणं कोष्णवारिणा। पथ्याशिभिस्तु पुरुषैः सततं परिशीलनम्।।
वातिकं श्लेष्मिकं वापि सज्वरं वाऽपि विज्वरम्। सकोष्ठबद्धं व्यथया चीत्कारयुतयापि वा।।
(रसतरं. १४/१३१-१३५)

Apparatus required

Śarāvas, cloth, mud (multhani), *Khalva yantra,* Cowdung cakes etc.

Drugs required

Properly ripened *Arka patra*	:	one part
Saindhava lavaṇa cūrṇa	:	one part

Procedure

Equal weight of *arka patra* and powdered *Saindhava lavaṇa* are colleted and in the bottom of *śarāva, arka patra's* are placed first, then over those *arka patra's, saindhava lavaṇa cūrṇa* is to be spreaded in thin layer form, again over that same manner different rows *arka patra* and *saindhava lavaṇa* has to be arranged according to the requirement. Then the mouth of the *śarāva* is closed with the mouth of the other *śarāva (śarāva sampuṭa)* and *sandhi bandhana* is made. Then after this *śarāva* is kept in *gaja puṭa* total cowdung cakes are burned and when *śarāva sampuṭa* becomes into *swānga śītala* state, it should be taken out and *sandhi bandhana* is removed, then internal content is collected, which is having the colour equal to that of *kajjali.* Then it is kept in *khalva yantra* and made into powder form and called as *arka lavaṇa.* This should be preserved in glass container.

Mātra : 4 ratti

Anupāna : *Uṣnodaka*

Karma : *Ruci karam, mala bhedhanam.*

Āmayika prayoga

Yakruth pliha roga, udara roga, atisāra, jwara and *viṣama jwara* can be treated by changing the *anupāna.*

Nārikela lavaṇa

सुविपक्वं ससलिलं नारिकेलं समाहरेत्। अपनीयं जटां वृद्धिपत्रेण स्फोटयेद् दृशम्।।
जातरन्ध्रान्नारिकेलान्नीरं सर्वं परित्यजेत्। सुचूर्णितं सैन्धवं तु दशतोलकसम्मितम्।।
निक्षिप्य रन्ध्रमार्गेण ततो रन्ध्रं निरोधयेत्। वसनेन समाच्छाद्य परितो लेपयेन्मृदा।।
रोद्रयन्त्रे विशोष्याथ पुटयेत्तु महापुटे। तद्गोलकं स्वाङ्गशीतं प्रयत्नेन समाहरेत्।।
सैन्धवं कज्जलीवर्णं कपालांशोज्झितं हरेत्। लवणो नारिकेलाख्यः समाख्यातो भिषग्वरैः।।
लवणो नारिकेलो यः पाचनः पित्तनाशनः। अम्लपित्तहरः कामं पित्तशोषजशूलनुत्।।
वातजं पित्तजं शूलं श्लेष्मजं सन्निपातजम्। शूलञ्च परिणामोत्थं नाशयेदविकल्पतः।।
(रसतरं. १४/१२३-१२९)

लवणो नारिकेलाख्यो माषकद्वयसम्मितः। नृसारयवजोपेत पित्तशोषजशूलनुत्।।
(रसतरङ्गिणी १४)

नारिकेलं सतोयं च लवणेन सुपूरितम्। मृदाववेष्टितं शुष्कं पक्वं गोमयवह्निना।।

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पिप्पल्या भक्षितं हन्ति शूलं च परिणामजम् । वातिकं पैत्तिकञ्चापि श्लेष्मिकं सान्निपातिकम् ।।

(भावप्रकाश-शूलरोगे)

Appratus required

Śarāvas, cloth, mud, *khalva yantra,* cowdung etc.

Drugs required

Ripened coconut fruit-1, *saindhava lavana cūrna* 10 tola

Procedure

Take water containing fully ripened coconut fruit and remove all external fiber content, then provide hole at one end (near by *nārikela netra*) and coconut water should be collected in one vessel. (Regarding removing of the water from coconut different concepts are present, *Ācārya Sri Bhāva Miśra* mentioned that, water should not be taken out and *saiṇḍhava lavaṇa cūrṇa* has to be filled directly without removing water. This method seems to be more reliable because active principles present in the coconut water also attribute to the *saindhava lavaṇa*). Then *saindhava lavaṇa cūrṇa* is filled into the coconut fruit and this hole is covered with *1 angula* thickness (*multāni*) mud layer. Then it is exposed to sun light and dried. After this, it is again covered with cowdung in thin layer. Then it is kept in *Gaja puṭa* and heated. After the *swānga śithala* coconut fruit is taken out and removed the external coverings and coconut shell is bracked and collected internal soft mass (including *lavaṇa*) and this content is grinded with *nārikela jala* in *khalva yantra* and dried. Then it is preserved in the glass containers. This will have the colour equal to that of *kajjali* (black colour)

Mātra : 2 *māṣa*

Anupāna : *Jala*

Karma : *Dīpana, pācana*

Āmayika prayoga

Āmla pitta, udara śūla, pariṇāma śūla

Masī kalpanā

चतुष्पदानां त्वग्रोमखुरशृङ्गास्थिभस्मना । तैलाक्ता चूर्णिता भूमिर्भवेद्रोमवती पुनः ।। (सु. चि. १/१०२)

Introduction

Masī kalpanā is mentioned in *Suśruta Saṁhitā* in some instances, *Ācārya Suśruta* has mentioned that, by using some of the animal products like *roma, twak, sṛnga* can be prepared and it will be used for production of hair.

Masī kalpanā is the product which is similar to the calx or carbon and is used to treat different diseases both externally and internally. *Masī kalpanā* will be prepared from both animal and plant materials. Some of the common *masī kalpanā* mentioned in *Āyurveda* are *Hastidanta masī, Triphala masī, Mṛgasṛngabhasma masī, mayūra piccha masī* etc.

Method : Medicinal drug is taken into *śarāva* and it is closed other *śarāva* and binded with *sandhi bhandhana* and this *śarāva saṁpuṭa* is kept in *puṭa* and drug is heated by burning the cowdung cakes. If at all drug is heated in *śarāva* which is open with out any closure then drugs will get burnt produce white colour *kṣāra* and its pharmacological characters also differs from *masī kalpanā*. Hence that indicates while preparing *masī kalpanā* drug has to be covered completely with earthen pots, so that it can

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be avoided that, direct exposure of drug for atmospheric air while preparation. Variety of *puṭa* can be selected on the basis of medicinal drug consistence which is used for *masī kalpanā.* After *swāngaśītala, śarāva saṁpuṭa* is removed and internal drug should be collected and powdered with the help of *khalva yantra,* then it is sieved with cloth and obtained product is called *masī kalpanā* which is similar to the black colour subtance of carbon. It has to be preserved in glass containers.

Uses : It is used both externally and internally for the treatment of different diseases.

Hastidantamasī

हस्तिदन्तमसीं कृत्वा मूत्रं चैव रसाञ्जनम् । लोमान्येतेन जायन्ते लेपात् पाणितलेष्वपि ।। (सु. चि. १/१०१)

हस्तिदन्तमसीं कृत्वा छागीदुग्धं रसाञ्जनम् । लोमान्येतेन जायन्ते लेपात् पाणितलेष्वपि ।। (भा. प्र. चि. ६१/१०)

Apparatus required

Khalva yantra, śarāvas, cloths etc.

Durgs required

Hastidanta : Appropriate quantity

Procedure

Hasti danta pieces are made into powder form and it is placed in *śarāva* then it is closed with other *śarāva* and *sandhi bhandana* has to be done. Then this *śarāva saṁpuṭa* is kept in *laghupuṭa* and cowdung cakes are burned. After *swānga śītala, śarāva saṁpuṭa* is opened and internal substance is collected and grinded in *khalva yantra,* then it is filtered with cloth and preserved in glass containers.

At present in market, *hastidanta* is very costly, hence *hastidanta* pieces and coarse powder can be obtained with low cost from some factories, where toys are prepared by using *hastidanta.*

Āmayika prayoga

Duṣṭavraṇa and other chronic skin infections *khālitya, pālitya.* In *Suśruta Saṁhitā* it is mentioned that, both *Hasti danta masī* (1 *śāṇa*) and *rasānjana* (1 *śāṇa*) in equal quantity are taken and mixed with *gomūtra.* It is advised to apply over skin leasions effected with *indralupta.* In *Bhāva Prakāsa* also same *yoga* is mentioned, but it is advised to mix with goat milk (instead of *gomūtra*) while application.

Mātra : 1/2 gm to 1 gm for internal administration and for external application it is used in appropriate quantity.

Triphalā masī

Apparatus required

Khalvayantra, śarāva, cloth etc.

Drugs required

Haritaki : 1 part
Vibhītakī : 1 part
Āmalakī : 1 part

Procedure

Take the above mentioned drugs and make them into coarse powder and it is placed in *śarāva* and closed with the help of other *śarāva* and *sandhi bhandhana* is made. Then this *śarāva sampuṭa* is kept

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in *laghupuṭa* and burned. After *swānga śītala sarāvas* are opened, internal subtance is collected and grinded in *khalvayantra,* then it is filtered with cloth and preserved in glass containers.

Ayaskṛti

Synonyms

Ayaskṛti, ayoraja, ayascūrṇa.

Introduction

The word *ayas* means *loha.* In ancient days *loha* is the word commonly used for all the *dhātus.* Later *loha* word is applied only for iron (Fe). During the *saṁhitā kāla, sūkṣma cūrṇa* form of *lohas* are advised for internal administration. During the *saṁhitā* period *swarṇa, rajitha, tāmra, loha cūrṇas* are mentioned for the treatment of different disease conditions, which can be considered under the name of *ayaskṛti.* For processing of *dhātus* into *sūkṣma cūrṇa* form there are two different methods are mentioned in both *Caraka saṁhitā* and *Suśruta saṁhitā* too, as mentioned below.

According to Caraka saṁhitā

In *Caraka saṁhitā, ayaskṛti* is mentioned by the name of *loharasāyanam.*

त्रिफलाया रसे मूत्रे गवां क्षारे च लावणे। क्रमेण चेङ्गुदीक्षारे किंशुकक्षार एव च।।
तीक्ष्णायसस्य पत्राणि वह्निवर्णानि साधयेत्। चतुरङ्गुलदीर्घाणि तिलोत्सेधतनूनि च।।
ज्ञात्वा तान्यञ्जनाभानि सूक्ष्मचूर्णानि कारयेत्। तानि चूर्णानि मधुना रसेनामलकस्य च।।
युक्तानि लेहवत् कुम्भे स्थितानि घृतभाविते। संवत्सरं निधेयानि यवपल्ले तथैव च।।
दद्यादालोडनं मासे सर्वत्रालोडयन् बुधः। संवत्सरात्यये तस्य प्रयोगो मधुसर्पिषा।।
प्रातः प्रातर्बलापेक्षी सात्म्यं जीर्णे च भोजनम्। एष एव च लोहानां प्रयोगः सम्प्रकीर्तितः।।
अनेनैव विधानेन हेम्नश्च रजतस्य च। आयुः प्रकर्षकृत्सिद्धः प्रयोगः सर्वरोगनुत्।।

(च. चि. १.३.१५-२३)

Procedure

Tīkṣṇa loha patras are made in the measurement of four *angulis* length and wedth, its thickness should be equal to the *tila.* These *tīkṣna loha patras* are heated till they become red hot state and dipped in *triphala kwātha, go-ṃūtra, jyotiṣmati kṣārodaka, ingudi kṣārodaka, kiṁśuka (palāsa) kṣārodaka* one after the other. This process should be repeated till the *lohapatra* will get the colour like *añjana* (blackish). Then it should be made into *sūkṣma cūrṇa* form with the help of *khalva yantra.* This *cūrṇa* should be mixed with *madhu* and *āmalaki rasa* till it gets the consistence of *lehya* and it should be preserved in earthen pot which is get applied with *goghṛta.* This has to be kept for one year under the heap of *yava* and every month appropriate quantity of *madhu* and *āmalaki swarasa* are added and mixed well, then again it has to be kept as it is. Same manner total 12 times every month has to be done. After the passing of one year duration, this *loha rasāyana* should be administered in *prātah kāla* along with *madhu* and *ghṛta.* This *loha rasāyana mātra* should be adjusted according to *agnibala.* After the digestion of medicine evening *sātmyāhāra* is advised.

This is useful for the treatment of *abhighātaja vikṛti, akālamṛtyuharam* it increases the *roga kṣamatva śakti, rasāyanam,* like elephant person will get the *bala, indriyabalakaram, buddivardhakam, vāksiddikaram, dhāraṇaśaktivardhakam, buddivardhakam, vāksiddikaram, dhāraṇaśaktivardhaka, āyuṣyam, sarvarogaharam, dhanavṛddikaram,* these all can be achieved after continuous administra-

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tion of *loha rasāyana* for one year by following restrictions while administration. *Swarṇa, rajita* etc. *dhātus* are also advised to prepare *sūkṣma cūrṇa* form (*ayaskṛti lohacūrṇa*) by following same procedure.

Ayaskṛti preparation according to suśruta saṁhitā

तीक्ष्णलोहपत्राणि तनूनि लवणवर्गप्रदिग्धानि गोमयाग्निप्रतप्तानि त्रिफलाशालसारादिकषायेण निर्वापयेत् षोडशवारान् । ततः खदिराङ्गारतप्तान्युपशान्ततापानि सूक्ष्मचूर्णानि कारयेद्घनतान्तवपरिस्रावितानि । ततो यथाबलं मात्रां सर्पिर्मधुभ्यां संसृज्योपयुञ्जीत । जीर्णे यथाव्याध्यनम्लमलवणमाहारं कुर्वीत । एवं तुलामुपयुज्य कुष्ठमेहमेद श्वयथुपाण्डुरोगोन्मादापस्मारानपहत्य वर्षशतं जीवति । एतेन सर्वलौहेष्वयस्कृतयो व्याख्याताः । (सुश्रुत संहिता चि. १०.११)

Paste has to be prepared with *pañca lavaṇa* by adding appropriate quantity of water and this paste is applied over the thin form of *tīkṣna loha patras* and these *tīkṣna loha patras* are subjected to heat with fire which is produced by cowdung cakes till they get red hot state, then dipped in *triphala kwātha* and *śālasārādi gaṇa kwātha,* in each liquid the process should be repeated for 16 times. Then it is made into *cūrṇa* with the help of *loha khalva yantra. Cūrṇa* is filtered into *sūkṣma cūrṇa* form with the help of cloth. This is administered internally along with *madhu* and *ghṛta* in the dose of 2 *ratti. Mātra* can be adjusted according to the *bala* of the patient. After the digestion of medicine patient is advised to take *āmlalavaṇa rasa rahita āhāra.* It is mentioned that after the intake of one *tula* of *ayaksṛti cūrṇa* in divided doses for a certain period, that person can get rid of *kuṣṭa, prameha, medovṛddi, śotha, pāṇḍuroga, unmāda* and *apasmāra* etc. diseases and that person can live up to 100 years. This *yoga* is called *ayaskṛti.* By following this same pracedure *ayaskṛti* can be prepared with *swarṇa, rajita* and *tāmra* etc. *dhātus.*

Preparation of śālasāradigaṇa kwātha : Below mentioned drugs are to be taken in equal quantity and made into *yavakūṭa cūrṇa* and used for the preparation of *kwātha.*

Śālasārādi gaṇa—

1. *Śālavṛkṣa*
2. *Ajakarṇa*
3. *Khadira*
4. *Kadara* (*pūti* or *sweta khadira*)
5. *Kālaskandha* (*tamālavṛkṣa*)
6. *Pūgīphala*
7. *Bhojapatra*
8. Meṣasṛngi
9. *Tiniśa*
10. *Raktacandana*
11. *Kucandana*
12. Śīśam
13. *Śirīṣa*
14. *Asana*
15. *Dhavapuṣpa*
16. *Tālamūlī*
17. *Śāka* (*sāgavan*)
18. *Karanja*
19. *Pūtīkaranja*
20. *Aśwakarṇa*
21. *Agaru*
22. *Kalīyaka*

Kṣīra pāka

Kṣīrapāka is the one of the unique preparations of *Āyurvedic pharmaceutics.* Here milk is used as a media for the formulation. Because milk is a emulsion form, having capability to dissolve mainly water soluble, protein soluble and fat soluble ingredients to some extent, from the drugs used for *kṣīrapāka* preparation. Besides to this, milk is also having antacid activity due to its alkalinity. Because of more dietic value of milk it is used as a dietic regimen, and as well as medicine. Because of its palatability, it

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can be used easily for treatment purposes. Because of alkalinity of milk and its antidote activity *kṣīrapāka* can be used in wide range.

Usually *kaṣāya rasa dravyās* are used for the preparation of *kṣīrapāka* i.e. *Arjuna kṣīra pāka.* Reason is that because of the irritability of the *kaṣāya rasa,* acceptance of these drugs in direct form is comparatively less. Hence ancient *Āyurvedic* scholars have made a step to make the palatable form of *kaṣāyarasa dravyās* by the name of *kṣīrapāka.* Moreover synergetic action of both milk and medicinal drugs also achieved by means of this formulation.

Arjuna, rasona etc. *dravyās* are made *pāka* in milk by following *kwātha vidhi* like preparation. As these drugs are having *tīkṣna vīrya,* that will be reduced by doing *kṣīrapāka* and also by doing so, active principles will get dissolved in milk.

For making the milk *laghu pāki* (easily digestable), *śuṇṭī kṣīrapāka, ārdhraka kṣīrapāka, pañcamūla kṣīrapāka* etc. are also mentioned. Usually for making *kṣīrapāka,* drugs which are having *āmla* and *lavaṇa rasa* are not supposed to be taken, because *āmlarasa* and *lavaṇarasa* drugs will spoil the milk.

Drug is mixed after making it into coarse powder (*yavakūṭa cūrṇa*) form. Always *kṣīra pāka* has to be prepared in *mandāgni* (low temperature), so that sensitive active principles may not get spoiled with severe temperature. It can be administered by mixing appropriate quantity of sugar.

Preparation methods of kṣīrapāka mentioned in various Āyurvedic classics :

Śārṅgadhara concept regarding kṣīra pāka

क्षीरमष्टगुणं द्रव्यात्क्षीरान्नीरं चतुर्गुणम् । क्षीरावशेषं तत्पीतं शूलमामोद्भवं जयेत् ।। (शा. सं. म. २.१६१)

One part of drug (e.g. *Arjuna*) is boiled in 8 parts of milk with the addition of 32 parts of water. The boiling is continued till the water is get evaporated and milk alone is left (*kṣīravaśeṣam* i.e., part 8). It is used for treatment of *śūla* and *āma.*

Drug is mixed after making it into coarse powder (*yavakūṭacūrṇa*) form. Always *kṣīra pāka* has to be prepared in *mandāgni* (low temperature). So that sensitive active principles may not get spoiled with high temperature. It can be administered by mixing appropriate quantity of sugar.

Arjuna, rasona etc. *dravyas* are supposed to be made *pāka* in milk by following *kwātha vidhi* like preparation.

As these drugs are having *tīkṣna vīrya,* that will be reduced by doing *kṣīra pāka* and also by doing so, active principles will get dissolved in milk. For making the milk *laghu pāki* (easily digestable) *śuṇṭi kṣīra pāka, ārdhraka kṣīra pāka, pañcamūla kṣīra pāka* etc. are also mentioned.

Usually for making *kṣīra pāra* drugs which are having *āmla* and *lavaṇa rasa* are not supposed to be taken, because *āmlarasa* and *lavaṇa rasa* will spoil the milk.

Vṛdda Vāgbhaṭa concept related with kṣīra pāka

क्षीरादिसहितं च द्रव्यं न सम्यङ्भुक्तरसं भवतीति वारिक्वाथपूर्वकं क्षीराद्यैस्तदुपदेशे अनुपदग्धं क्वाथयेत् ।

(अ. सं. क. ८.१२)

क्षीरादिसहितं तदुपदेश इति क्षीरदधिमस्तुमूत्राद्युपदेशे तदौषधं वारिक्वाथपूर्वकमनुपदग्धं क्वाथयेत् । स्तोकेन तु वारिणा प्रथमं क्वाथयेत् ततस्तेनैवोदकेन सह क्षीरादिभिः क्वाथयेदित्यर्थः । एतच्च निर्यूहिष्वेव साध्येषु विज्ञेयम् । न तु स्नेहपाकेष्वपि । तथा च षट्पलादिषु यत्र क्षीरादिकं द्रवं पठितं तत्रोक्तस्यैव द्रवस्य प्रयोगमभिमन्यन्ते न तु जलदानमङ्गीकुर्वन्ति । केचितु यत्र स्नेहाच्चतुर्गुणं द्रवं क्षीराद्यन्यतमे नोक्तमपि तु स्नेहस्य समं वा द्विगुणं वा त्रिगुणं वा चतुर्गुणत्वापादनाय द्रवं स्नेहाच्चतुर्गुणमित्यनया परिभाषया पठितं शेषं जलमेवेच्छन्तीति । (इन्दु टीका)

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When medicinal drugs are made *pāka* with *kṣīra* etc. (i.e. *kṣīra, dadhi, mastu, mūtra*), medicine may not release active principles completely into the milk. Hence by using medicinal drug, *kwātha* is prepared. Equal quantity of this *kwātha* and *kṣīra* are taken, then heated with *mandāgni* till milk alone is left (*kṣīrāvaśeṣam* i.e., part 8).

In this method care is taken to avoid the charning of the milk.

Here *Vāgbhaṭa's* technique regarding *kṣīrapāka* is seems to be more relaible for separation of more active principles from the drug and introducing them into milk.

Ācārya Yadavaji Trikamji (dravya guṇa vijñāna) concept

क्षीरं तिथिगुणं द्रव्यात् क्षीरान्नीरं समं मतम् । क्षीरावशेषं कर्त्तव्यं क्षीरपाके त्वयं विधिः ।।

(द्र. गु. वि. आचार्य यादवजी)

Medicinal drug	:	1 part
milk	:	15 parts
water	:	15 parts

All are mixed and made *pāka* till total quantity is reduced upto the quantity equal to milk (15 parts) then filtered and collected liquid is called *kṣīrapāka.*

Anupāna : *Sita, śarkara*

Āmayika Prayoga

Āma śūla, jīrṇa jwara etc.

For *hṛdroga—arjuna tvak kṣīra pāka.*

For *udavartha, āmavāta—śuṇṭi, kṣīra pāka, rasona kṣīra pāka* etc. are used.

Kṣāra kalpanā

Kṣāra are derivatives of plant drug ashes in the form of solutions or crystals, all of which have the basic quality of being alkaline. According of their state, liquid or solid, they are called as *drava kṣāra* (liquid form) and *cūrṇ kṣāra* (amorphous form) respectively. The *kṣāra* belong to the *agnibhūta* since the properties of *kṣāra* are burning and destructive, that simply means the material is caustic.

तत्र क्षरणात् क्षणनात् वा क्षारः । (सु. सू. ११/४)

The substance is called *kṣāra,* because it causes *kṣaraṇa* to, *māṁsa* etc. *dhātus.*

क्षरणातू क्षारः नासौ रसः द्रव्यं तदनेकरस समुप्तन्नमनेकंरसं कटुकलवण भूयिष्टमने केन्द्रियार्थसमन्वितं करणाभिनिर्वृत्तमू ।

(च. सू. २६/१)

Because of its corrosive nature (*kṣaraṇāt*) it is known as *kṣāra* (alkali), *kṣāra* is not having *rasa,* this is manifested by the combination of many *rasas* and it possesses itself many *rasas* dominated by *kaṭu* and *lavaṇa rasas.* It is the object of many senses and it involves a special method of preparation.

There are many reasons for which, *kṣāra* cannot be attributed to particular *rasa. Kṣāras* are prepared by combination of drugs like *muṣkaka apāmārga* etc. each of them having different *rasas.* Since in the cause, that is the raw drug, there are many *rasas,* the effect, that is, *kṣāra* must be in a compound form of *rasas. Kaṭu* and *lavaṇa rasas* are dominant in *kṣāras.* These apart, there are also many other subsidiary *rasas* in it. *Kṣīras* can be verified by smell and touch.

Judging from this principle, *kṣāra* is matter and not qualities like *rasa* where there is neither touch

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nor smell. Further, preparation like *rasa* where there is neither touch nor smell. Further, preparation of *kṣāra* involves a definite procedure like filteration (*parisrāvaṇa*).

Ācārya cakrapāṇi has mentioned that, the term *kṣāra* implies some thing which goes down.

Here *adhogamana* is *kārya* of *dravya,* hence *kṣāra* can be considered as a substance not of the *rasa.* Under the context of *rasas* discusion, *kṣāra* is considered as one of the *rasa,* among seven *rasas* (*madhura, āmla, lavaṇa, kaṭu, tikta, kaṣāya* and *kṣāra*) by *videha rāja nimi,* later it was concluded by *Atreya Maharṣi, kṣāra* as a *dravya* not of the *rasa* for the above said reasons.

Ācārya Caraka under context of *gulma cikitsa* efficacy of *kṣāra* has mentioned, like wise :

छित्वा छित्वाऽऽशयात् क्षारः क्षरत्वात् क्षारयत्यधः ।। (च. चि. ५/५८)

Kṣāra has the property of *kṣaraṇa,* hence it gradually erodes *kaphaja gulma* and brings it downwards.

It is stated that the physicians hould administer *kṣāra* after ascertaining the nature of the *doṣa,* physical constitution, nature of *gulma* and nature of the season. *Kṣāra* is more effective against *kapha doṣa,* it better suits a person having *kapha* type of physical constitution; it is more effective if the *gulma* is stabilised and it is most convenient to be administered either during the early or later part of winter. If all these factors are present, *kṣāra* should be repeated at an interval of one day. If only a few of these factors are present, it should be administered at an interval of two or three days.

Ācārya Cakrapāṇi has mentioned that, while administering *kṣāra,* the patient should be given meat, milk and ghee in order to enable him to maintain his bodily strength.

Characters

By touch it is having *śīta guṇa.*

It is hygroscopic, hence when it is exposed to atmospheric conditions, it absorbs moisture. The colour of *kṣāra* will be white.

It provides different tastes, when it is tasted.

Ācārya Śārṅgadhara concept regarding processing of *kṣāra :*

क्षारवृक्षस्य काष्ठानि शुष्काण्यग्नौ प्रदीपयेत् । नीत्वा तद्भस्म मृत्पात्रे क्षिप्त्वा नीरे चतुर्गुणे ।।
विमर्द्य धारयेद्रात्रौ प्रातरच्छं जलं नयेत् । तन्नीरं क्वाथयेद् वह्नौयावत्सर्वं विशुष्यति ।।
ततः पात्रात्समुल्लिख्य क्षारो ग्राह्यः सितप्रभः ।। (शा. म. ११.१०२-१०३)

Dried parts of trees which exude milky sap are burnt in to ash form in fire. The ash thus obtained is dissolved in four times of water in a mud pot and kept overnight. Next day morning the clear supernatant water is decanted out into a clean vessel and boiled till all the water evoporates, leaving of a fine white powder at the botton. This is known as *kṣāra.*

Ācārya Yādavaji concept regarding processing of *kṣāra :*

Kṣāra vṛkṣa pancāngās are collected and dried, then they are burnt (burning should be done till matter get burnt) to ash form and that ash is dissolved in six times of water in an earthen pot and kept for one night. Next day morning contents should be rubbed with hands and filtered for 21 times and obtained liquid is heated like *kwātha,* till total water content is get evoparated (heating should be done over *mandāgni*) then *kṣāra* is obtained which is similar to the colour of *sita.*

E.g. of kṣāra	*Part used for kṣāra preparation*
Apamārga kṣāra	*Apamārga pñcāngas*

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Yava kṣāra	*Yava*
Palāsa kṣāra	*Palāsa*
Kadali kṣāra	*Kadali kañda*
Snuhi kṣāra	*Snuhi pañcānga*
Arka kṣāra	*Arka pañcānga*
Tila kṣara	*Tila pañcānga*

According to *Rastaraṅgaṇi* processing of *kṣāra* mentioned like wise :

क्षारवृक्षस्य काष्ठानि दग्ध्वा भूतिं समाहरेत् । विमले भाजने न्यस्य सलिलन्तु चतुर्गुणम् ।।
प्रक्षिप्य मर्दयेत् सम्यक् याममात्रं भिषग्वरः । त्रिगुणीकृतवस्त्रेण स्रावयेत् सलिलं ततः ।।
स्रावितं सलिलञ्चाथ वह्नौ सन्तापयेततः । निःशेषं सलिलं ज्ञात्वा निर्मलक्षारमाहरेत् ।।

(र. त. १४.५९-६१)

Kṣāra vṛkṣa kāṣṭa are dried and burnt into ash form (fine powder). The ash thus obtained dissolved in four times of water and rubbed with hands properly and contents are kept without any disturbance for 3 hours. Then contents are filtered with three folded cloth for many times. This filtered liquid is boiled in an earthen pot till total water content get evaporated. The soft form of *kṣāra* is obtained.

Concept of different Āyurvedic scholars regarding processing of kṣāra kalpanā

According to *Śāraṅgadhara saṁhitā, rasa taraṅgiṇi kṣāra vṛkṣa* (trees), *kāṣṭa* (wood) are supposed to be collected, where as *Ācārya Yādavaji* mentioned that *kāṣṭauṣadhi pñcāngās.*

क्षारास्तीक्ष्ण महोष्णाश्च दाहकर्मकराः परम् । गुल्माशौग्रहणीप्लीहमूत्रकृच्छ्राश्मरीहराः ।।
कृमिघ्नाः पाचनाश्चैव दारणाश्च विसर्पिणः । शोधना रोपणाश्चैव मूत्रलाश्च प्रकीर्तिताः ।।

(र. त. १४.६२-६३)

According to *Rasataraṅgiṇi* if *yava kṣāra* etc. *Sūka dhānya* are used for *kṣāra* is preparation. Then *Pañcāngas* of those should be collected when *kṣāra* is prepared from *palāsa* etc., then *kāṣṭa* (wood) of those should be collected.

All scholars have mentioned that, the collected drug for *kṣāra* should be burnt in to ash form. But regarding dissolving of this obtained ash in water in an earthen pot specially mentioned by *Ācārya Śāraṅgadhara.* This is accepted by *Ācārya Yādavji* too. Earthen pot specifically mentioned may be because of its neutral form. As *kṣāra* is having alkaline nature, it may react with vessels made of aluminium etc.

Regarding the ratio of ash and water quantity, *Ācārya Śāraṅgadhara* mentioned that ash should be dissolved in 4 times of water. In *Rasataraṅgiṇi* also same ratio (four times of water) is mentioned, where as according to *Ācārya Yādavji trikamji* ash should be dissolved in 6 times of water. Regarding the time duration of keeping ash and water together, *Ācārya Śāraṅgadhara* has mentioned for one night and it is followed by *Ācārya Yādavji* too. Whereas according to *Rasataraṅgiṇi* ash and water together can be kept only for three hours (one *yāma*), regarding the number of times filteration of contents, *Ācārya Yādavji* specifically mentioned that to filter total twenty one times with a cloth and in *Rasataraṅgiṇi* it is mentioned that, contents has to be filtered with folded cloth which is folded three times. This type of care regarding the filtration is mentioned may be because to avoid the undissolved macro particles of ash ultimately to facilitate the production of fine *kṣāra.*

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General procedure of kṣāra preparation

Kṣārayukta apamārga, palāśa etc., plant *opañcāṅgas* or *kāṣṭa* (according to speficication) are collected and dried properly. Collected into *loha pātra* (iron pan) and burnt to ash form, till all particles are burnt properly. Then this ash is dissolved in 4 times or 6 times of water in an earthen pot and rubbed with hands properly for some time. Then these contents are kept as it is without any disturbance for one night or 3 hours, then supernatant water portion is separated to another pot (sedimented ash content should be thrown out), then this separated water should be filtered for 21 times with three folded cloth. This filtered water portion is boiled till the total water content gets evaporated. Finally white colour soft *kṣāra* is obtained and it is preserved in tightly packed glass containers. Exposure of *kṣāra* to cold atmosphere makes the *kṣāra* in to wet form because of its hygroscopic nature. *Ācārya Suśruta* has mentined three varieties of *kṣāra* as mentioned below.

1. *Mṛdu* 2. *Madyama* 3. *Tīkṣaṇa*

On the basis of mode of administration of *kṣāra, Ācārya Śāraṅgadhara* (*Shri Dwivedi too*) has mentioned two varieties.

चूर्णाभः प्रतिसार्यः स्यात्पेयः स्यात् क्वाथवत् स्थितः । इति क्षारद्वयं धीमानुक्तकार्येषु योजयेत् ।। (शा. म. ११.१०४)
क्षारं तु द्विविधं प्रोक्तं पानीयं पाययेत् सुधीः । लेपादौ योजयेत् प्रतिसारणीयं भिषग्वरः ।।

(भा. भै. क. वि. श्री द्विवेदी)

It is used in two ways

1. *Pratisāraṇiya kṣāra - kṣāra* used for external application.

2. *Peya* (*pāniya*) *kṣāra - kṣāra* used for internal administration. (Above mentioned *mṛdu, madhyama, tīkṣana* varieties can be applied as varieties of *pratisārāṇiya kṣāra* whereas varieties of *pāniya kṣāra* are *kṣāradwaya, kṣāratraya, kṣārapañcaka, kṣāraṣṭaka*) etc.

Kṣāra
- *Pratisāraniya kṣāra*
  - *Mṛdu*
  - *Madhyama*
  - *Tikṣana*
- *Pāniya*
  - *Kṣāradwaya*
  - *Kṣāratraya*
  - *Kṣārapañcaka*
  - *Kṣārāṣṭaka* etc.

Kṣāra Varga

Following groups of *kṣāras* may form *kṣāra varga* viz.

Kṣāra dvaya—Svarji kṣāra, yava kṣāra

Kṣāratraya—Svarji kṣāra, yava kṣāra, taṅkaṇ kṣāra

Kṣārā Ṣaṭka—Lāṅgalī, tilanāla, mokṣaka, śigru, mayūraja and *yavaka kṣāra*

Kṣārāṣṭaka—Tilanāla, palāśa, mokṣaka, śigru, mayūrajakṣāra and *kṣāra traya*

Vṛkṣa kṣāra—The *kṣāras* obtained from vegetable drugs, viz., *tila, apāmārga, kadalī, palāśa, śigru, mokṣaka, mūlaka, ārdraka* and *ciñcākṣāras* are included

Khanija kṣāra—Taṇkaṇa kṣāra, Sarja kṣāra, Sūrya kṣāra

Kṣāra daśaka—In this group also vegetable *kṣāras* viz. *cukrikā, pīlu, palāśa, mūlaka, śigru, citraka,*

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nimba, mocaka, sikharī and *ikṣukṣāra* are included.

द्विगुजंतः समारस्य रक्तिकाष्टकसंमितान् । क्षारास्तु विनियुंजीत साधारणतया भिषक् ।। (र. त. १४/६४)

Kṣāra mātra—2 to 8 *guñja* (250 mg to 1,000 mg)

Medecinal plants which are usefull for the preparation of *kṣāra* are given below.

कुष्ठजपालाशाश्वकर्ण परिभद्रबिभीतकारग्वध बिल्वकऽर्क स्नुह्यपामार्ग पाटलानक्तमालवृक्षाककदली चित्रक पुतीकेन्द्रकवृक्षास्फीता अश्वमारक सप्तच्छदाग्निमन्यगुञ्जाचतस्रः कोशातकी समूलपत्रफलशाखा दहेतू ।

(शा. सं. म. ख. ११/१०२-१०४ पाद टिप्पणी)

1. *Kuṭaja*
2. *Palāśa*
3. *Aśwakarṇa*
4. *Pāribhadra*
5. *Vibhītaki*
6. *Aragwadha*
7. *Bilwa*
8. *Arka*
9. *Snuhī*
10. *Apamārga*
11. *Pāṭala*
12. *Naktamāla*
13. *Vṛkṣaka*
14. *Kadalī*
15. *Citraka*
16. *Pūtīka*
17. *Indra vṛkṣa*
18. *Āsphoṭa*
19. *Aśwamāra*
20. *Saptacchada*
21. *Agnimantha*
22. *Guñja caturvidha*
23. *Kośātakī*

Kṣāra Guṇas

तीक्ष्णोष्णो लघु रूक्षश्च क्लेदीपक्ता विदारणः । दाहनो दीपनश्छेत्ता सर्वः क्षारोऽग्निसन्निभः ।। (च. सू. २७.३०६)

Acārya Caraka has mentioned *kṣāra guṇas* like wise : *Kṣāra* is *tīkṣana, uṣna, laghu, rūkṣa, kledana, pācana, vidāraṇa, dagdhakaram, dīpana, cedanam,* there by *kṣāra* works like *agni.*

नैवातितीक्ष्णो न मृदुः शुक्लःश्लक्ष्णोऽथ पिच्छिलः । अविष्यन्दी शिवः शोघ्रः क्षारो ह्यष्टगुणः स्मृतः । (सु. सू. ११.१६)

Ācārya Sūśruta has mentioned eight *kṣāraguṇas* like wise : *Kṣāra* is not more *tikṣana,* it is not *mṛdu* and *kṣāra* is *śukla, slakṣaṇa, piccila, abhisyandi, śiva* (*kalyānakāri*), *śīghra prabhāva kāri.*

Ācārya vāghbhaṭa has mentioned 10 types of *kṣāra guṇas* like wise :

नातितीक्ष्णमृदुःश्लक्ष्णः पिच्छिलः शीघ्रगः सितः। शिखरी सुखनिर्वाप्यो न विष्यन्दी न चातिरूक् ।।
क्षारो दशगुणः..... (अ. हृ. सू. ३०.२४)

1. *Nātitikṣana*
2. *Mṛdu*
3. *Slakṣana*
4. *Piccila*
5. *Sīghraga*
6. *Sita*
7. *Sikhari*
8. *Sukhanirvāya*
9. *Aviṣyandi*
10. *Nātiruk*

Kṣāra guṇas mentioned by different scholars are mentioned here under

Caraka Saṁhitā (11)	*Suśruta Saṁhitā* (8)	*Aṣṭāngahṛdaya* (10)
1. *Tikṣaṇa*	1. *Nātitīkṣṇa*	1. *Nātitīkṣaṇa*

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2. *Uṣṇa*	2. Not so *mṛdu*	2. Not so *mṛdu*
3. *Laghu*	3. *Śukla*	3. *Sita* (*Sweta varna*)
4. *Rūkṣa*	4. *Slakṣaṇa*	5. *Picchila*
5. *Kledi*	5. *Picchila*	4. *Slakṣaṇa*
6. *Pakta*	6. *Aviṣyandi*	6. *Aviṣyandi*
7. *Vidārṇa*	7. *Śiva*	7. *Sukhanirvāpya*
8. *Dāhakāraka*	8. *Śīghrakāri*	8. *Śīghragāmi*
9. *Dīpana*		9. *Sikhari*
10. *Kṣedana*		10. *Nātiruk*
11. *Agni sadṛśa*		

Author of *rasārṇava* has mentioned that, *malanāśaka guṇa* is a *viśeṣaguṇa* of all the *kṣāras.*

Ācārya Bhāvamiśra has mentioned that, *kṣāra* is equal to *agni* and it is useful for the treatment of *gulma, śūla.*

Administration of kṣāra

While formulating different *yogas, kṣāra* has to be mixed in the form of *cūrṇa,* when *kṣāra* is used for the purpose of *dāha, pāka, vidaraṇa, chedana karmas,* it has to be mixed in water and applied in the form of *pratisārana* or *lepana.*

Kṣārāsūtra

भावितं रजनीचूर्णैः स्नुहीक्षीरे पुनः पुनः । बन्धनात् सुदृढं सूत्रं भिनत्यर्शोभगन्दरम् ।। (चक्रदत्त अर्शरोग. १४७)

कृशदुर्बलभीरूणां गतिर्मर्माश्रिता च या । क्षारसूत्रेण तां छिन्द्यान्न शस्त्रेण कदाचन ।। (चक्रदत्त नाडीव्रण. १०)

The threads are prepared with surgical linen size 20 by repeatedly smearing it with the latex of *snuhi* (euphorbia nerifolia) and a combination of certain vegetable caustics grown on a large scale in India and other parts of southern asia.

These substances are :

1. Fresh latex collected from the plant euphorbia nerifolia (*snuhi*) (family euphorbiacae) by stabbing the stem at various places.

2. A specially prepared alkaline powder (*kṣāra*) derived from the plant Achyranthes aspera (*apamārga*) (family Amaranthacea). This powder is obtained by the evaporation of the filtered solution of the burnt ashes of this plant in the water, this method is indigenous to the Indian system of medicine and is termed *kṣārapatan* the powder thus obtained is also caustic and is locally used as a debriding agent in chronic non-healing ulcers. It has a pH of 8-9.2.

3. A fine powder of the dried rhizomes of curcuma longa (*haridra*) (family zingiberaceae). These rhizomes are commonly used as an ingredient of cooking spices and are termed as turmeric. The processing of the thread is done inside a specially designed cabinet.

This cabinet is provided with a device for hot blast for drying the threads and an ultraviolet light for sterilization, the temperature of the chamber is recorded with the help of a thermometer. The cabinet contains 25 hangers on which the surgical linen No. 20 is spread and hooked throughout. After the thread is properly hooked into the hanger replaced into the cabinet for drying when dry, it is again resoaked in the same manner in a fresh material and the process is repeated for as many as 7 times. When this part of the procedure is completed the next 7 coatings are done with the latex and the *kṣāra*

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powder after processing with latex, thus permitting the particles of the powder to stick over the wet thread, after which it is allowed to dry. In the final phase of preparation of thread the remaining 7 coatings are similarly done with the latex and turmeric powder. During the processing the threads are sterilized by ultra violet light. The tubes are marked for the date of preparation the length of the thread etc. and are sealed. They are preserved in sterile glass tubes.

Method of application of thread

After the patient is examined thoroughly and selected for this treatment routine investigations are completed and in selected cases the fistulogram is also done. He is advised to take a mild aperient a night prior to the application of the thread in order to have clean bowels and to attend the ano-rectal clinic, the next morning. For application of the thread the patient is placed in the lithotomy position and the perineum is cleaned with antiseptic lotion and draped with sterile towels. A tray containing sterilized instruments specially designed probes of different sizes etc. is kept already on the right side of the rectum and the inner opening of the fistula is located as far as possible.

The selected probe is then passed through the external opening of the tract and is slowly pushed in the direction of the least resistance. The tip of the probe is guided into the anal aperture by rotating the handle of the probe slightly or by depressing it. In cases of blind external fistulae it is some times necessary to use mild force to pierce the anal canal at a point which is most bulging and closed to the rectal mucosa. A fresh and sterilized thread from the sealed tube is threaded through the eye of the probe pulled out thus leaving the thread are tied outside the anal orifice firmly.

It may be mentioned that this is a painless process and the patient do not need any anaesthesia for initial passing or successive change of the thread. It is important to tie the thread neither the tight nor too loose, since a tight thread will cut though the tissues rapidly and thus will not permit the desired action of the caustics on the fibrous wall of the fistula. A too loose thread will not cut through the tissues at all and unnecessarily hamper healing of the wound. A moderately firm grip of the thread is sufficient to give optimum, desired result and the patient is sent home with instructions to be carried during the next seven days, after which he is again called and the thread is changed. He is advised to take bath for 10-15 minutes every day during the first week. Changing of the thread requires no special technique. A fresh thread is tied to the original thread near the knot and is guided gradually through the other end by rail—road technique. The changing of the thread removed and is replaced by a fresh one. The changing of the length of the thread removed at every sitting is measured and the results plotted on a graph. This gives an idea of the rate of cutting in each individual. It is to be emphasized at the point that the cutting through the tissues is usually synchronous with the healing of the wound, that is to say that, the wound produced by the next week while the fresh wound is being created by the migrating thread. In some cases where healing and cutting are unco-ordinate the cutting is controlled by lossening or tightening and cutting the grip of the thread and changing the thread and changing the threads at suitable intervals. In majority of the cases the healing and cutting achieved simultaneously.

Apamārga kṣāra

मयूरक्षारकः कामं मधुना परिशीलितः । विनाशयेच्चिरोद्भूतं श्वासं परमदारुणम् ।।
खरमञ्जरिकाक्षारचूर्णेन परिसाधितम् । तैलं कर्णे निषेकेण बाधिर्यं त्वाशु नाशयेत् ।।
सत्र्यूषणः किणिक्षारो यवानीचूर्णसंयुतः । निहन्ति शूलं त्वचिरादाध्मानञ्चातिदारुणम् ।।
अपामार्गक्षारचूर्णं सशिलं परिलेपितम् । गोमूत्रेणाचिरेणैव श्वित्रकुष्ठं विनाशयेत् ।।

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अपामार्गक्षारचूर्णं यवाग्रजसमन्वितम् । शीलितं नाशयेदाशु मूत्रकृच्छ्रं तथाश्मरीम् ।।
खरमञ्जरिकाक्षारः सव्योषञ्च ससैन्धवः । शीलितो नाशयेद् गुल्मं प्लीहानश्चाति दारुणम् ।। (रसतरं. १४)
द्विगुञ्जतः समारभ्य रक्तिकाष्टकसम्मिताम् । क्षारास्तु विनियुञ्जीत साधारणतया भिषक् । (रसतरं १४/६४)
खरमञ्जरिकाक्षारस्तीक्ष्णः श्वासनिर्वहणः । गुल्मशूलादिरोगघ्नः कामं वाधिर्यनाशनः ।। (रसतरं १४/६६)

Apparatus required

Loha pātra, cloth etc.

Drugs required

Properly grown *apamārga pañcānga* : Required quantity

Procedure

Completely developed *apamārga pañcānga* are collected and it is cleaned well then dried completely in sunlight. Dried *pañcānga* of *apamārga* is to be taken in an big iron pan and burned completely. After *swānga śītala,* ash is collected and mixed with 4 times of water (6 times of water according to other reference) then mixed well and filtered with cloth, into another *loha pātra.* These contents are kept for one night as it is, next day morning the clear supernated part of water is filtered with a cloth into another vessel like this 3, 4 times this water is filtered, then this water is heated over the *madhyamāgni* till all the water content is get evaporated and *śweta varṇa* (white) *kṣāra* is produced then this *kṣāra* is taken into glass container and preserved with tight closure. It should not be exposed to moisture because of its higroscopic nature it absorbs moisture from atmosphere and looses its solid crystal state.

Guṇa : *Tīkṣna, pichila, slakṣna*

Karma : *Tridoṣaghna, śwāsahara, gulmahara, mūtrala, śūla hara, bhādirya hara, dīpana, pācana, anulomana, śwedajana.*

Āmayika prayoga

Śwāsa, kāsa, udāraśūla, ādhmāna, mūtrāvarodha, bhādhirya, gulma, udararoga, świtra.

Mātra : 250 mg. 1 gm. (according to *doṣa, bala*) and *vayas* dose an be adjusted.

Anupāna : *Madhu,* water.

Snuhi kṣāra

स्नुहीक्षारः स्मृतस्तीक्ष्णः सर्वोदरविनाशनः । गुल्मप्रशमनो वह्निदीपनः शोफनाशनः ।।
विसूचिकाहरोऽजीर्णनाशनः शूलसूदनः । यकृद्दोषप्रशमनः श्वासातङ्कप्रभञ्जनः ।।
(रसतरं. १४)

स्नुहिक्षारः शङ्खभूतिः सर्जिकायवजान्वितः । विसूचिकां निहन्त्याशु त्वजीर्णञ्चातिदारुणम् ।।
चिरोत्थितानां गुल्मानां पञ्चानां पञ्चतां नयेत् । ग्रहणीं नाशयेयाशु तथा शुलं च दारूणम् ।।
स्नुहिक्षारस्त्रिलवणः क्षारत्रिकसमन्वितः । निहन्ति शोफप्लीहानमुदराणि च नाशयेत् ।।
सज्यूषणः स्नुहीक्षारो मधुना परिशीलितः । नाशयेदचिरादेव श्वासं परमदारुणम् ।।
स्नुहीक्षारो वरोपेतः सैन्धवाग्निसमन्वितः । निहन्ति वह्निमान्द्यं तु यकृत्प्लीहोदराणि च ।।
(रसतरं. १४)

Apparatus required

Vessels, cloth, knife etc.

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Drugs required

Snuhi Appropriate quantity

Procedure

Snuhi is collected and it is made into pieces and it should be dried in sulight. When *snuhi* is get dried properly, then these are collected and burned completely. From that burned ash *kṣāra* is prepared according to *kṣāra vidhi.*

Guṇa and karma : Tīkṣna, agnidīpana karam, gulma, śotha, udararoga, visūcika, ajīrna, śūla, śwāsa and *yakṛt roga haram.*

Āmayika Prayoga

Five types of *gulma, grahaṇi, śūla.*

For the treatment of severe form of *visūcika, snuhikṣāra, śankhabhasma, sarjikā kṣara, yavakṣāra,* all are mixed in equal quantity and administered in appropriate dose. *Snuhi kṣāra* mixed with appropriate quantity of *saindhava lavaṇa, sourcaka lavaṇa, viḍālavaṇa, yavakṣāra, taṇkaṇa kṣāra* and administered for the treatment of *śotha, plīharoga, udararoga, snuhi kṣāra* mixed with *trikaṭu cūrṇa, madhu* and administered for the treatment of severe *śwāsa roga, snuhi kṣāra* mixed with *triphala cūrṇa, saindhava lavaṇacitraka cūrṇa* and taken along with water for the treatment of *agnimāndhya, yakṛtroga, plīharoga* and *udara roga.*

Above mentioned drugs should be mixed with *snuhikṣāra* in appropriate quantity.

Khamira

Auṣadhi dravya kwātha is prepared and it is mixed with appropriate quantity of sugar in a vessel and *pāka* is made by heating, till it reaches to the consistency of *avaleha*, then rest of the medicinal drug powders and *swarna, roupya* etc. *dhātu bhasma* are added. Then total contents are mixed well for many times, till the colour of the contents becomes white in colour. This is basically a unany formulation.

Lavuka and *majun* are also other varieties of unani formulations which are similar to our *avalehya kalpanā.*

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Chapter 19

SNEHA KALPANĀ

The nomenclature of *Sneha kalpanā* is sum of words sneha and *kalpanā*. Where *sneha* means fat or fatty material and *kalpanā* stands for pharmaceutical process of medicaments.

गुरूशीतसर स्निग्ध मन्दसूक्ष्ममृदुद्रवम् औषधं स्नेहनं प्रायो। (अ० सं० सू० २५.३)

The substance which is called *sneha dravya* will be having *guru, śīta, sara, snigdha, manda, sūkṣma, mṛdu, drava guṇas.*

In *Āyurveda, ghṛta kalpanā* and *taila kalpanā* are included in *sneha kalpanā.*

Sneha is obtained from two *yonies* (Sources) i.e., *stāvara* and *jāngama.*

Tila, priyāla, abhiṣuka, bibhītaki, danti, harītaki, eranda, madhūka, sarṣapa, kusumbha, bilwa, āruka mūlaka, atasī, nikocaka, akṣoda, karañja and śigru, these are *stāvara* sources of *sneha.*

As regards the *jāngama yoni*, fish, quadruped animals and birds come under this group.

Ghṛta, taila, vasa and *majja* are the best *sneha dravyas* of all. Amongst them *ghṛta* is the *sneha dravya* par- excellence because of its power to assimilate effectively the properties of the substances.

The medicated ghee or oils of our pharmacopoea, which are prepared by successively boiling or cooking them with drug decoctions etc. we know how potent and efficacious they prove in the hands of our *vaidyas*.

Ghṛta

सर्पिस्तैलं वसा मज्जा सर्वस्नेहोत्तमा मताः। एषु चेवोत्तमं सर्पिः संस्कार स्यानुवर्तनात्।। (च. सू. १३.१३)

Ghṛta is objtained from the class Mammalia of the Animal kingdom (*jāngama*) especially cow, she-buffalo, goat, sheep, she-cammel, and mare. Out of these except the last two, the rest are the main sources of milk and milk products in the areas of their *habitat*. Though the *ghṛtas* of these animals posses many common features, *Āyurveda* discriminates their particular features also and recommends the *Goghṛta* (cows-ghee) as best and the *ghṛta* of choice for both, food and medicinal purposes, So that in the *Āyurvedic* classics and tradition, if not specified, the epithet *ghṛta* always applies to *Goghṛta* (cows-ghee).

In *Bhāva Prakāśa* it is mentioned that *ghṛta* (ghee) is a *rasāyana* tasty, good for the eye, stimulant for digestion, supports glow and beauty, enhances memory and stamina, promotes longevity and protects body from various diseases.

Clarified milk fat or butter fat is known as *ghṛta* (ghee). It is prepared by heating butter or cream to just over 100 °C to remove water content by evaporation.The residue is filtered out as pure ghee.

The composition of ghee residue obtained from Indian cow is as follows.

Moisture	14.4%
Fat	32.4%
Protein	36.0%
Lactose	12.0%
Ash	5.2%

The colour of ghee is yellow to white depending upon the carotene content. Ghee contains approximately 8% lower saturated fatty acids which makes it easily digestible. These lower saturated fatty

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acids are the most edible fat and which are not found in any other edible oil or fat.

Ghee also contains Vitamin A, D, E, and K. Vitamins *A & E are anti- oxidant* and are helpful in preventing oxidative injury to the body. No other edible fat or oil contains Vitamin A except fish oil. Vitamin A keeps epithelial tissue of the body intact, keeps the outer lining of the eyeball moist and prevents blindness. Ghee also contains 4-5% linoleic acid as essential fatty acid, which promotes proper growth of human body.

During preparation of ghee, protein casein is removed. Animal studies have shown that casein elevates cholesterol. Ghee resists spoilage by micro organisms or chemical action. The melting point of ghee is 35 ^{0}C which is less than the normal human temperature of the body. Its digestibility coefficient or rate of absorption is 96%, which is highest of all oils and fats.

Most *Āyurvedic* preparations are made with ghee. Digestion, absorption and delivery to a target organ system is crucial in obtaining the maximum benefit from any formulation.This is facilitated by ghee. Since active ingredients are mixed with ghee, they are easily digested and absorbed. Lipophilic action of ghee facilitates transportation to a target organ and final delivery, inside the cell, because cell membrane also contains lipid. This lipophilic nature of ghee facilitates entery of the formulation into the cell and its delivery to the mitochondria, microsome and nuclear membrane.

Composition of Cow Milk Ghee

Constituents	*Percent*
Triglycerides	97-98
Diglycerides	0.25-0.4
Monoglycerides	0.016-0.038
Keto Acid Glyceride	0.015-0.018
Glycerylesters	0.011-0.015
Free Fatty Acids	0.1-0.44
Phospholipids	0.2-1.0
Sterols	0.22-0.41
Vitamin A	2500 I.U. per 100 gms.
Vitamin D	8.5 x10-7 gm. per 100 gms.
Vitamin E	24 x10-3 gm. per 100 gms.
Vitamin K	1 x10-4 gm. per 100 gms.

In the process of evaluating the activities of natural compounds, it has been found by means of sophisticated research that when herbs are mixed with ghee, their activity and utility is potentiated, many times.

Composition of Cow Milk Ghee glycerides

Fatty Acids	*Percent*
Butyric acid	4.5-6.0
Caproic acid	1-1.36
Caprylic acid	0.9-1
Capric acid	1.5-1.8
Lauric acid	6-7

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Myristic acid	21-23
Palmitic acid	19-19.5
Stearic acid	11-11.5
Arachidic acid	0.5-0.8
Oleic acid	27-27.5
Linoleic acid	4-5

Ghee contains beta-carotene and Vitamin E and both are known anti oxidants. It is estimated that 80% to 90% of degenerative diseases are related to excessive production of free radicals of re-active oxygen species. When free radicals are in excess, they try to latch on to whatever is available in their surrounding area, and this is how the lipids in the blood and cell membranes are oxidized. The oxidized lipids or the lipid peroxides are injurious to the system. As we know, they trigger the process of atherosclerosis.The reactive oxygen species also cause damage to the DNA in the cells. Excessive free radicals have been associated with inflammatory diseases like lupus, diabetes mellitus, ageing, atherosclerosis, cancer, skin, pigmentation, wrinkling and skin tumors in sun- exposed areas. The effectiveness of may *Āyurvedic* compounds is due to potent anti-oxidant properties of removing of scavenging free radicals.

This property is potentiated by ghee which creates good medium for absorption, transport and delivery of the *Āyurvedic* formulations to the proper area of the body. One or two teaspoonful of ghee in food increases digestive power and also assists in assimilation.

In summary, ghee in general and cow ghee in particular, is one of the easily digestible and assimilable food which provides essential nutrients and critical anti-oxidants to the human body for its protection and growth.

Ghṛta alleviates *pitta* and *vāta*, is beneficial for *rasa dhātu*, *śukra dhātu*, and *ojas*. It has *śita guṇa* (cooling), *mṛdukaram* (softening), *svara prasādanam* (improves voice) and *varṇa prasādanam* (improves complexion).

The *Goghṛta*, for the purpose of *sneha pāka* should be preferably old one (*purāṇa ghṛta*). On storage, with the age due to changes, *ghṛta* becomes unsuitable for food ingestion, but on the contrary it is attributed to possess pharmacodynamic properties and values for therapeutic use.

पुराणं दशवर्षास्थितम् (डल्हण सु. सू. ४५.१०८)

In the *Āyurvedic* terminology ten years old *ghṛta* is commonly designated as *purāṇa ghṛta*, and that of 111 years storage as *kumbhasarpih* and of beyond that age as *mahāsarpih*, which are attributed for their specific pharmacodynamic and therapeutic uses. Apart from being preservative aspect, *ghṛta* when treated or impregnated with other drugs, it has a specific property of accepting the attributes of these drugs without losing its own characters. In other words, *ghṛta* has the capacity to transform itself so as to imbibe all the qualities of the substances added to it. This assimilating property is not so prominent in other *sneha dravyas*. It is particularly significant that ghee does't give up its own properties even if it mixed up with other substances possessing other properties. Inspite of the fact that *ghṛta* transforms itself so as to imbibe *rūkṣa* and *uṣna guṇas* of *citraka* (Plumbago Zeylanica Linn.) added to it, *ghṛta* has the capacity to maintain own qualities like *sneha* and *śita guṇas*.

This specific attribute of the *ghṛta* observed by the *Āyurvedic* scholers, has been made use of in formulating a number of medicated *ghṛta* preparations for particular therapeutic uses.

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After taking *ghṛta* one should drink hot water. The *ghṛta* will generally solidify when cooled. It will have the colour, odour and taste of the drug or drugs used. In practice the medicated ghees are generally used internally.

Test for identification of ghee

Ghee may be adulterated by the addition of insoluble, non volatile fatty acids. This can be tested by finding out the polanski number. It is defined as the number of milliliters of 0.1N KOH required to neutralize the insoluble fatty acids, not volatile with steam distillation, obtained from 5g. of fat. The polanski number is usually negligible or very low in pure ghee.

Taila

This *taila*, for the purpose of *sneha pāka*, should be preferably new one. Because *taila* may undergo for rancidity and get spoiled by storage and water contamination.

The word *taila* means oily portion extracted from the drugs. Whereas *tila taila* means oily portion extracted from the seed of sesamum indicum (Fam. Pedaliacae), a herb which is widely cultivated in India, China, Japan and many tropical countries. This oil is one of the official oils in the European Pharmacopeia, British Pharmacopeia and British Pharmacopeial codex. In latin it is named as sesame (sesamum) oil and in English it is called gingily oil.

Ācārya caraka mentioned that *tila taila* is best amongst the drugs in pacification of *vāta*.

Taila alleviates *vāta* but, at the same time, does not aggravate *kapha*. It promotes strength, is beneficial for skin, *uṣṇa guṇa yuktam*, *sthirakaram* (provides firmness) and *yoniśodhanam* (cleans female genital passage). From therapeutic point of view another quality of *taila* is when treated with other drugs, it also takes the property of that drugs.

Judged from this angle, *taila* is the best *sneha dravya* in the sense that it does't only assimilate the substance added to it but also it foregoes its own properties. That is why for the allivation of the bodily heat during fever, *taila* mixed up with substances having cooling property like *candana* (santalum album linn.) is prescribed. Even though, *taila* itself is hot, when mixed up with drugs possessing cooling properties, it imbibes the cooling property in place of its own heating property. This radical transformation of qualities is not possible in ghee.

These attributes of the oil are widely applied in *Āyurveda* in the formulation of medicinal oil preparations (about 700 medicated *taila* preparations are on record in different *Āyurvedic* classics) recommended to be used for therapeutic uses in various forms like, local application, externally as abhyanga on the whole body or on the head (*śirobhyanga*), *nasya*, *karnapūraṇa* (ear drops), *akṣi tarpaṇa*, *gaṇḍūsa kavala graha*, *vasti*, and also orally for systemic effect. In practice medicated oils are generally used externally.

Eranda taila (castor oil) and *sarṣapa taila* (mustard oil) are also some times used in the preparation of medicated oil, the proportion of the oil ,the drugs paste and the fluids being the same as that when the taila the same oil is used. Of all kinds of tailas the taila that is produced from *tila* (Sesamum Indicum) is the best for purposes of giving strength and emollients.

Sesame contains large quantities of the essential polyunsaturated fatty acid (PUFA), linoleic acid, in the form triglycerides, The antineoplastic properties of many PUFAs such as linoleic acid and their metabolites are known.

Characters

The sesamum oil is a pale yellow limpid liquid, with a slight pleasant odour and a bland taste,

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having a density between 0.916-0.92 , it solidifies at- 5 oC where it forms a buttery mass.

The oil is soluble in chloroform, ether, pet-ether, carbon-di- sulphide, slightly soluble in alcohol and insoluble in water.

Chemical composition

Liquid fats (glycerides of oleic, linoleic acids)-70%

Solid fats (sterin, palmitin and myristin, a crystalline substance sesamin and phenol compound sesamol)-12-14%.

Āyurveda embraces the concept of using the entire natural product rather than attempting to isolate the "active ingredient". In this case, a whole vegetable oil such as sesame oil would be recommended rather than a presumed active ingredient such as linoleic acid alone in order to restore balance to the physiology.

Test for identifying pure form of tila taila : 2m 1 of *tila taila* is to be mixed with 1 m.l. Hcl containing 1% w/w of glucose and then allowed to stand for five mts. Then it turns into pink colour.

Āyurveda has been recommending the topical use of sesame,as well as other vegetable oils for thousands of years. Whole oils are generally regarded as safe(GRAS) for topical use buy the US Food and Drug Administration. It has been tradition of many cultures to regularly apply oils topically to the surfaces of the body. Oil- retention enemas are still advocated by modern medical practitioners for the treatment of certain colonic dysfunctions. While we do know that some of the topically administered oil is absorbed into the body (29,30), what we do not know is what percentage of the administered dose is absorbed. Since some successful animals model research has already been developed for other malignancies(2,6,31,32,33), we would like to suggest that further studies to assess the possible chemotherapeutic potential of these vegetable oils be warranted.

In ancient liturature there is immence discription regarding manufacture of *sneha kalpanā* (*ghṛta* and *taila kalpanās*). For preparing *taila kalpanā* and *ghṛta kalpanā*, first of all taila and *ghṛta* are supposed to undergo the process called *mūrchanasaṁskāra*. By doing *mūrchanasaṁskarā*, the *ghṛta* will loose *durgandha*, *āmatva* etc. *Doṣas* and also therapeutic potency of *sneha* increases ,it will be able to desolve more active principles from the *kalka* and *drava dravya*, while preparing *sneha kalpanā*.

Medicated *taila* and *ghṛtas* are preparations in which oil or ghee is boiled in prescribed *drava* (*kaṣāyas* etc.) and *kalka* of drugs according to the formula. This process ensures absorption of active therapeutic principles of the ingredients.

There are generally three essential components for the preparation of *sneha* (*ghṛta* or *taila*) viz. as mentioned below.

1. *Drava dravya* (A liquid which may be one or more as *kaṣāya*, *swarasa*, *dugdha*, etc.
2. *Kalka* (A fine paste of the drug or drugs).
3. *Sneha dravya* (*ghṛta, taila*, etc.).

Generally, unless otherwise mentioned in the text, if *kalka* is one part by weight, *sneha* should be four parts and the *drava dravya* should be sixteen parts.

The use of various *taila* and *ghṛta* preparations has been recommended for the treatment of different diseases in the *Āyurvedic classics*. These preparations are meant either for external or internal medication. 63 different medicated *tailas* and 44 different medicated *ghṛta* preparations are listed in official "*Āyurvedic Formulary of India*".

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While preparing *sneha kalpanā*, first of all *sneha* should undergo the *sammūrchana* (*mūrchana*). Then *kwātha* (*dravadravya*) is to be added to the *mūrchita sneha* and *sneha pāka* is to be done. *Dugdha, kalka*, has to be mixed with *sneha* according to their sequence and *sneha pāka* is to be done, *gandha dravyas* are mixed and at the end, for making proper *pāka*., equal to the *sneha* quantity water is to be added and *sneha pāka* is done over *mṛdwāgni* till total water content is get evaporated. After attaining *sneha siddha lakṣnas*, vessel has to be taken out from the fire and contents are filtered.

Sneha Mūrchanā

Before Preparing *sneha siddhakalpanā*, *sneha* is supposed to under go one particular *saṁskāra* called *snehamūrchanā*. It is applicable for both *ghṛta* and *taila*. The main aim of *sneha mūrchanā* is to remove the *durgandha, āmadoṣa* and *ugrata* etc. bad charaters of crude form of *sneha*. By doing *mūrchanā saṁskāra, sneha* get good smell and colour , apart from these, because of *mūrchanā, sneha* will get such a capability to recieve more active principles while the preparation of *sneha pāka* and also by doing *mūrchana*, the *Vīrya* (potency) of the *sneha* is enhanced. Because of *mūrchanā saṁskāra, sneha* will get the active principles of *mūrchanā dravyās* too.

मूर्च्छितं स्नेहमादाय प्रस्थं तदर्द्धमेव वा। चतुर्गुण द्रवं दत्वा कल्कं कल्क दत्वा तु पादिकम्।।
विपचेद् घट्यन् द्रव्यां यथापात्रोन सज्जति। सम्यक सिद्ध समालोक्य लानयेत् शुद्धभाजने।।

(नवपरिभाषा: उपेन्द्रनाथदास)

According to the *Navaparibhāṣa* text *mūrchita sneha* is specially indicated for the preparation of *sneha kalpanā*.

Some of the specifications to be fallowed while doing sneha mūrchanā.

1. *Sneha mūrchanā* should be done over *mandāgni*.
2. To avoid excieve burning of the medicine *cūrṇa* should be mixed after wetting (*cūrṇa* converted in to wet form by adding little amount of water).
3. *Cūrṇa* should be made into *yavakūṭa cūrṇa* form only for *snehamūrchanā*.
4. According to some of the scholars for the purpose of *snehamūrchanā*, drugs are advised in the form of *sūkṣma cūrṇa*.
5. Usually for the preparation of the *ghṛta kalpanā*, *Go-ghṛta* is advised.

Ghṛta Mūrchanā

पथ्याधात्रीविभीतैर्जलधरजनी मातुलुङ्गद्रवैश्च, सवैरेतै: सुपिष्टै: पलकपरिमितैर्मन्दमन्दानलेन।
आज्यं प्रस्थं विफेनं परिचपलगतं मूर्च्छयेद्वैद्यराजस्तस्मादामोपदोषं हरति च सहसा वीर्यवान् सौख्यदायि।।

(भै. र. ज्वर चि. ५.१२८५)

Apparatus required

Tin coated wide mouthed vessel, cloth, khalva yantra etc.

Drugs required

Harītaki	:	*1 tola*
Bibhītaki	:	*1 tola*
Āmalaki	:	*1 tola*
Nāgaramotha	:	*1 tola*
Haridra	:	*1 tola*

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Matulunganimbu swaras	:	*1 tola*
Ghṛta	:	*1 Prastha*
Water	:	*4 Prastha*

Procedure

Mentioned quantity of *Go-ghṛta* is taken in a vessel and heated slightly over *mandāgni* till the evaporation of water content, disappearance of foam and sound coming from *ghṛta*, then the mentioned drug is made into *sūkṣma cūrṇa* and they are made in to *kalka* form by mixing with *matūlunga nimbu swarasa*. Though it is not mentioned in *mūlagrantha* to add water, but in practice four times of water to that of *ghṛta* is added along with *kalka*. While adding the *kalka* it should be added little by little and mixed well, then *ghṛta pāka* is done till it gets the *sneha siddha lakṣaṇas*, after that vessel is taken out from the fire and *ghṛta* is filtered.

Uses

Mūrchitā ghṛta is used for the preparation of different *ghṛta kalpanās*.

Taila Mūrchanā

While preparing *taila kalpanā*, *tila taila* is very commonly used, but in certain occasions *sarṣapa taila* (*kaṭu taila*) and *eranḍ taila* also mentioned.

Tila Taila Mūrchanā

तैलं कृत्वा कटाहे दृढतर विमले मन्द मन्दानलैस्तत् तैलं निष्फेनभावं गतमिह च यदा शैत्यभावं समेत्य।।
मंजिष्ठारात्रिलोध्रैर्जलधरनलिकैः सामलैः साक्षपथ्यै सूचीपुष्पांघ्रनीरैरूपहितकथितैर्गन्धयोगं जहाति।।
तैलस्येन्दुकलांशिकैंकविकसा भागोऽपि मूर्च्छाविधौ। ये चान्ये त्रिफलापयोदरजनीह्रीबेरलोध्रान्विताः।।
सूचीपुष्पवटप्ररोहनलिकास्तस्याश्च पादांशिका। दुर्गन्धं विनिहन्ति तैलमरूणं सौरभ्यमाकुर्वते।।

(भै. र. ज्वर. अ. ५.१२ ८६-८७)

Apparatus required

Tin coated wide mouthed vessel, cloth, khalva yantra etc.

Drugs required

Manjiṣṭa	:	*1/16 part*
Haridra	:	*1/64 part*
Lodhra	:	*1/64 part*
Nāgaramotha	:	*1/64 part*
Nalika	:	*1/64 part*
Āmalaki	:	*1/64 part*
Harithaki	:	*1/64 part*
Vibhitaki	:	*1/64 part*
Kevaḍa	:	*1/64 part*
Kumari	:	*1/64 part*
Netra bāla	:	*1/64 part*
Tila taila	:	*1 part*

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Water	:	*4 parts*

Procedure

Tila taila is heated over *mandāgni* till the foam and sound is subsided, then vessel is taken out from the fire. Above mentioned drugs are made in to powder form and then converted in to *kalka* form by adding little amount of water, then this *kalka* and mentioned quantity of water is added to *tila taila* and heated for making *pāka* till up to the attaining the *taila siddha lakṣaṇas* then vessel is taken out from the fire and *taila* is filtered. This *mūrchita tila taila* will not posses any *durgandha*, and it is having its own specific colour.

Uses

Mūrchita tilataila is used for the preparation of different *taila kalpanās*.

If *taila* is required to be made *sugandhita*, then *mūrchanā* should be performed with *pañca pallava yoga* as mentioned below:

Drugs required

Taila	:	*1 kg.*
Āmra pallava	:	*1/4 part*
Jambu pallava	:	*1/4 part*
Kapiṭha	:	*1/4 part*
Bījapūraka pallava	:	*1/4 part*
Bilva	:	*1/4 part*
Jala	:	*2 times to the total quantity of pañca pallavas*
Dadhi	:	*1 part*
Lākṣa	:	*1/4 part to that of dādhi*
Badarī patra	:	*1/4 part to that of dādhi*
Swarjika kṣāra	:	*1/4 part to that of dādhi*

Procedure

Each of the *pañca pallavas* are pounded after adding with two times of water and with that, juice is extracted, then this juice and pounded leaves are added to the *tila taila*, while heating over *mandāgni*. *Lākṣa, Sarjakṣāra, Badarīpatra, Sarjakṣāra, Dhadhi* and 8 parts of water (8 times of that of *dadhi*) are taken in another vessel and cooked till the total contents are reduced to 1/8th part, then this reduced contents are mixed with *taila* (this reduced *dadhi* etc. mixture quantity should be 1/4th of the *taila* quantity) and *taila pāka* is prepared. This *taila* contains *sugandha*, and posses good colour.

Sarṣapa Taila Mūrchanā

वयस्थारजनीमुस्तबिल्वदाडिमकेशरैः । कृष्णजीरकह्रीबेरनलिकैः सविभीतकैः ।।
एतैः समांशै प्रस्थे च कर्षमात्रां प्रयोजयेत् । अरूणाद् द्विपलं तत्रा तोयश्चाढकसम्मितम् ।।
कटुतैल पचेत्तेन चामदाषहरं परम् ।। (भै. र. ज्वर. चि. ५.१२ ८८-८९)

Apparatus required

Tin coated wide mouthed vessel, cloth, *khalvayantra*.

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Drugs required

Āmalaki	:	*1 karṣa*
Haridra	:	*1 karṣa*
Musthaka	:	*1 karṣa*
Bilva twak	:	*1 karṣa*
Dāḍima twak	:	*1 karṣa*
Nāgakeśara	:	*1 karṣa*
Krisṇa jīraka	:	*1 karṣa*
Hrībera	:	*1 karṣa*
Nalika	:	*1 karṣa*
Vibhīthaki	:	*1 karṣa*
Manjiṣṭa	:	*1 karṣa*
Sarṣapa taila	:	*1 Prasta*
Jala	:	*1 aḍhaka*

Procedure

Mentioned quantity of *sarṣapa taila* (*Kaṭū taila*) is taken and slightly heated, then *kalka* of above mentioned drugs and water is added, then mixed well, contents are heated till *taila* get *sidda lakṣaṇās*. Then vessel is taken out from the fire and taila is filtered.

Under the context of *ghṛta mūrchana* and *taila mūrchana*, there is no specification regarding the quantity of water. But in case of *sarṣapa taila mūrcanā,* specifically the quantity of water mentioned as one *āḍhaka* or 4 times to that of quantity of *taila*.

Eraṇḍa Taila Mūrchanā

विकसा मुस्तकं धान्यं त्रिफला वैजयन्तिका। ह्रीबेरवनखर्जूरवटशुङ्गा निशायुगम्।।
नलिका भेषजं देयं केतकी च समं समम्। प्रस्थे शाणमितं देयं मूर्च्छने दधिकाञ्जिकम्।।

(भै. र. ज्वर. ५.१२९०-९१)

Apparatus required

Wide mouthed tin coated vessel, cloth, khalva yantra etc.

Drugs required

Eraṇḍa taila	:	*1 Prastha*
Manjiṣṭa	:	*1 ṣāṇa*
Mustaka	:	*1 ṣāṇa*
Dhānyaka	:	*1 ṣāṇa*
Harītaki	:	*1 ṣāṇa*
Vibhītaki	:	*1 ṣāṇa*
Āmalaki	:	*1 ṣāṇa*
Jayanti	:	*1 ṣāṇa*
Hrībera	:	*1 ṣāṇa*

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Vana Kharjura	:	*1 ṣāṇa*
Vaṭa Śṛngi	:	*1 ṣāṇa*
Haridra	:	*1 ṣāṇa*
Dāru Haridra	:	*1 ṣāṇa*
Nalika	:	*1 ṣāṇa*
Ketaki	:	*1 ṣāṇa*
Dadhi	:	*5 gms*
Kānjika	:	*5 gms*
Jala	:	4 times to the total quanity of taila.

Procedure

Eranḍa taila is heated in a vessel slightly, till up to the subsiding of foam and sound, then above mentioned drugs, *kalka*, *dhadhi*, *kānjika* and water is added and cooked till up to complete evaporation of total water content then vessel is taken out from the fire and *taila* is filtered.

According to some of the scholars instead of taking water, *dadhi* and *kānjika* together is advised to take in the quantity of 4 times to that of *taila*.

General method of sneha pāka

Sneha pātra

For the preparation of *sneha pāka* copper or iron pan or earthen part is taken. Usually wide mouthed and less depth having tin coated (*vanga lipta*) copper vessel is used in many places perticularly in Kerala where *sneha kalpanā* is prepared extensively.

Taila pātra should be wide mouthed because during process, if it is having narrow mouth, *taila* may come out.

If in very hot *taila* suddenly *kwātha is poured then taila* may jump from the vessel. Hence with the help of *darvi, kwātha* should be poured slowely.

Always *taila pāka* should be prepared in *mṛdu* and *madhyamāgni* only. Depending upon the quantity of *taila*, the size of the *taila pātra* should be selected.

Common method of preparation mentioned for both taila and ghṛta

There are generally three essential components are required for the preparation of *sneha kalpana* (*ghṛta* or *taila*) viz.

1. *Kalka* (a fine paste of the drug or drugs) – 1 part
2. *Sneha dravya* (*ghṛta*, *taila*) – 4 parts
3. *Drava dravya* (a liquid which may be one or more as *kaṣāya, swarasa, dugdha* etc.) – 16 parts.

The *mātra* (dose) of *sneha kalpanā* is one *pala*.

Process of sneha pāka

If it is *ghṛta pāka*, first *mūrchita ghṛta* has to be collected and melted in the *sneha pātra* with gentle heat. Then the *kalka* and the *drava dravya* to be used are added, and the whole contents boiled together till the watery portion get evaporated and *ghṛta* becomes free from froath.

In the case of *taila* the *kalka* and the *drava dravya* are mixed together, the *sneha* is then added, boiled and stirred continuously, so that the *kalka* is not allowed to adhere the vessel.

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According to *suśrutā saṁhitā* and *aṣṭāṅga saṅgraha*, *kalka* and *dravadravya* are advised to mix in *sneha*. According to the *keralīya vaidyas* while preparing the *sneha kalpanā*, first the *kalka dravya* is mixed in *drava dravya*, then this mixture of *kalka* and *drava dravya* is poured in slightly heated *sneha* and *sneha pāka* is prepared, this will fascilitate uniform distribution of active principles in the *sneha*, ultimately enhances the efficacy.

According to the well known *Āyurvedic physicians* of *Rājasthan* in their practice of *sneha kalpanā* preparation, first of all *kalka* is made, kept in the form of bolus. *Sneha* is heated slightly in a vessel, taken out from fire and the pieces of *kalka* bolus are added little by little into the *sneha*, stirred continuously with *darvi* this is followed because to avoid over burning of the *kalka* and over flouring with foam of the *sneha*. Like this after doing *bharjana* of the *kalka* mentioned quantity of *drava dravya* is added, then vessel is kept over the fire and *sneha pāka* is prepared. By doing so there is a chance of enhancement of efficacy of *sneha kalpanā*.

Some times in *sneha pāka* (*ghṛta* or *taila pāka*) *drava dravyas* are directed to be added one after another as the process of boiling is continued and the fluid taken up earlier is found to have evaporated.

Ācārya cāraka concept regarding sneha pāka

जलस्नेहौषधानां तु प्रमाणं यत्रा नेरितम्। तत्र स्यादौषधात् स्नेहः स्नेहात्तोयं चतुर्गुणम्।

(च. क. अ. १२/१०१)

While preparing *sneha kalpanā* if the quantity of the water, *sneha*, and *auṣadha dravya kalka* if not mentioned, in such conditions one part of the *auṣadha*, 4 parts of *sneha*, 16 parts of water is advised.

Ācārya suśruta concept regarding sneha pāka

स्नेहभेषजतोयानां प्रमाणं यत्रा नेरितम्। तत्रायं विधिरास्थेयो निर्दिष्टे तद्वदेव तु।।
अनुक्ते द्रवकार्ये तु सर्वत्रा सलिलं मतम्। कल्कक्वाथावनिर्देशे गणातस्मात् प्रयोजयेत्।।

(सु. चि. अ. ३१/९-१०)

When there is no specifications of *drava dravya*, then water is advised, same way if there is no specification of *kalka* and *kwātha*, in such conditions mentioned *dravya varga*, *kalka*., *kwātha*, can be prepared.

The following method of sneha pāka (ghṛta or taila pāka) mentoined in śāraṅgadhara samhita as follows:

कल्काच्चतुर्गुणीकृत्य घृतं वा तैलमेव वा। चतुर्गुणे द्रवे साध्यं तस्य मात्रा पलोन्मिता।।
निक्षिप्य क्वाथयेत्तोयं क्वाथ्यद्रव्याच्चतुर्गुणम्। पादशिष्ट गृहीत्वा च स्नेहं तेनैव साधयेत्।।

(शा० सं० म० ख० ९.१-२)

Medicated *sneha* i.e. *ghṛta* or *taila* is prepared by mixing one part of *kalka*, four parts of *ghṛta* or *taila* and sixteen parts of any *drava dravya* (*kwātha* etc). The dose of *sneha kalpanā* is one *pala* . For preparing *kwātha*, one part of *dravya* (drug) is boiled in four parts of water and reduced to a quarter.

Kalka is prepared by finely grinding the drugs in a *khalva yantra*, when fresh herbs are used. For dry drugs water to be added to make paste. Some times other liquids are prescribed for addition during the process of grinding.

According to the general rule , the quantity of the *kalka* to be added 1/4th part with respect to the

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quanity of *sneha*. But some times this principle varies with the different liquid substances that are used for preparation of *sneha kalpanā*.

If *sneha* is to be prepared with *kṣīra*, *dadhi*, *swarasa* or *takra*, then the quantity of *kalka* should be added in 1/8th part of the liquids.

कल्कहीनस्तु य: स्नेह: स साध्य: केवले द्रवे । पुष्पकल्कस्तु य: स्नेहस्तत्रा तोयं चतुर्गुणम् ।।
स्नेहे स्नेहाष्टमांशश्च पुष्पकल्क: प्रयुज्यते । (शा. सं. म. ख. ९/११-१२)

When *puṣpa kalka* is to be added its quantity should be 1/8th of the quantity of *sneha* and water is taken four times the quantity of *sneha*.

If in formula, no *kalka dravya* is prescribed, then the drugs of the *kwātha* may be used as *kalka*. The proportion of the *kalka* is 1/4th of the *sneha*.

Drava dravya

Drava dravya may be one are more like *kaṣāya, swarasa, dugdha, dadhi, takra, kānji, dhānyāmla, lākṣārasa, māṁsarasa,* etc.

चतुर्गुणं मृदुद्रव्ये कठिनेऽष्टगुणं जलम् । तथा च मध्यमे द्रव्ये दद्यादष्टगुणं पय: ।।
अत्यन्तकठिने द्रव्ये नीरं षोडशिकं मतम् । (शा. सं. म. ख. ९.३-४)

For preparing *kwātha* if the drugs are of *mṛdu* (soft nature) e.g. *Guḍūci* etc. water is taken four times of their quantity, if *madhyama* (medium) e.g. *daśamūla* etc. *kaṭhina* (moderately hard) eight times and *atyanta kaṭhina* (very hard) e.g. *Padma Kāṣṭa* etc. sixteen parts of water are taken and reduced to quarter.

कर्षादित: पलं यावत्क्षिपेत्षोडशिकं जलम् ।।
तदूर्ध्व कुडवं यावद्भवेदष्टगुणं पय: । प्रस्थादित: क्षिपेन्नीरं खारी यावच्चतुर्गुणम् ।।
(शा. सं. म. ख. ९/४-५)

While preparing *Kwātha* if the quantity of each drug varies from one *karṣa* to one *pala*, water should be sixteen times, if from *pala* to *kuḍava* water should be eight times, if from *prastha* to *khāri*, water is taken four times the quantity only.

अम्बुक्वाथरसैर्यत्रा पृथक्स्नेहस्य साधनम् । कल्कस्यांशं तत्रा दद्याच्चतुर्थं षष्ठमष्टमम् ।।
दुग्धे दध्नि रसे तक्रे कल्को देयोऽष्टमाशक: । कल्कस्य सम्यक्पाकार्थं तोयमत्रा चतुर्गुणम् ।।
द्रवाणि यत्रा स्नेहेषु पञ्चादीनि भवन्ति हि । तत्रा स्नेहसमान्याहुर्यथापूर्वं चतुर्गुणम् ।।
(शा. सं. म. ख. ९/७-८)

If *sneha* is to be prepared with only water, *kwātha, māṁsa rasa, swarasa*, then their quantity should be four , six and eight times of the *kalka* respectively. If *sneha* is to be prepared with *kṣīra, dadhi, māṁsa rasa* or *takra*, the *kalka* should be one eighth part and water four times of it. If in the *sneha* more than five *drava dravyas* mentioned then those *drava dravyas* should be taken in equal quantity to *sneha*. If *drava dravyas* are lesser than five, then those *drava dravyas* should be taken four times to the *sneha*.

Preparation of sneha kaṣāya

The word *sneha kaṣāya* for the first time found in *Suśruta Saṁhitā* and later in *Bhoja tantra*.

According to *Vaidyaka Parbhāṣa pradīpa* for the preparation of *kwātha* which is used for *sneha*

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kalpanā the specifications are mentioned like this, *yava kūṭa cūrṇa* form of *kwātha dravya* should be mixed with eight times of water and it is boiled till content is reduced to 1/4th quantity.

Bhoja, the author of *Bhoja tantra* has described 14 varities of *kaṣāya* preparations, which includes *sneha kaṣāya*.

When *kaṣāyas* used on a large scale, the proportion of water taken to prepare those *kaṣāyas* goes on decreasing order.

The proportions are as follows :

Showing Sneha *Kaṣāya* according to various authors

Sl.No.	*Name of author*	*% of drug to be taken*	*% of water to be taken*	*Reduction part*	*Name of the Kaṣāya*
1.	*Suśruta*	1 Part	8 Parts	1\4	*Sneha Kaṣāya*
		1 Part	16 Parts	1\4	*Sneha Kaṣāya*
		1 Tula	1 *Droṇa*	1\4	*Sneha Kaṣāya*
2.	Bhoja	1 Part	4 Parts	1\4	*Sneha Kaṣāya*
3.	Śārngadhara	*Mṛdu*			
		1 Part	4 Parts	1\4	*Sneha Kaṣāya*
		Madhyama & Kaṭhina			
		1 Part	8 Parts	1\4	*Sneha Kaṣāya*
		Atyanta Kaṭhina			
		1 Part	16 Parts	1\4	*Sneha Kaṣāya*
4.	*Cakradatta*	1 *Karṣa* to			
		1 Pala	16 Parts	1\4	*Sneha Kaṣāya*
		1 Pala to			
		1 *Kuḍava*	8 Parts	1\4	*Sneha Kaṣāya*
		1 *Prastha* to			
		1 *Khāri*	4 Parts	1\4	*Sneha Kaṣāya*

Showing different types of Kwātha according to Bhoja:

Sl.No.	*% of drug to be taken*	*% of water to be taken*	*Reduction Part*	*Name of the Kaṣāya*
1.	1 Pala	24 Palas	1\8	*Pāna Kaṣāya*
2.	1 Part	4 Parts	1\5	*Ganḍūṣa Kaṣāya*
3.	1 Karsa	1\2 Pala	1\4	*Pānīya Kaṣāya*
4.	1 Part	4 Parts	1\8	*Śeka Kaṣāya*
5.	1 Part	6 Parts	1\6	*Āschyotana Kaṣāya*
6.	1 Part	3 Parts	1\12	*Varna- Prakṣālana Kaṣāya*
7.	1 Part	8 Parts	1\9	*Mukha-Prakṣālana Kaṣāya*
8.	1Part	8 Parts	1\3	*Śodhana Kaṣāya*

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9.	1Part	6 Parts	1\7	*Āsthāpana Kaṣāya*
10.	1Part	3 Parts	1\2	*Vamana Kaṣāya*
11.	1 Part	6 Parts	1\8	*Virecana Kaṣāya*
12.	1 Part	60 Parts	1\2	*Snāna Kaṣāya*
13.	1 Part	64 Parts	1\8	*Yavāgu Kaṣāya*
14.	1 Part	4 Parts	1\4	*Sneha Kaṣāya*

Addition of other drava dravyas (other aqueous medium)

In addition to the *kaṣāya, swarasa* or water, other *drava dravyas* are also used in *sneha pāka*. They are mainly *kṣīra, dadhi, takra, kānji, dhānyāmla, lākṣārasa, māṁsarasa* etc. when no specific liquid is mentioned for the preparation of *sneha pāka*, water to be taken as a liquid. When *kṣīra* has to be added, then it should be added in equal quantities with *kaṣāya*. In case of *dadhi* the quantity is same, but in order to procure the active constituents easily water to be added 4 times to *dadhi*.

When the *drava dravyas* number is up to 4, then each of these should be taken 4 times to the quanity of *sneha*, and if the number is more than four, these should be taken in equal quantity to *sneha*.

वर्तिवत्स्नेहकल्कः स्याद्यदाङ्गुल्या विमर्दितः ।।
शब्दहीनोऽग्निनिक्षिप्तः स्नेहः सिद्धो भवेत्तदा। यदा फेनोद्गमस्तैले फेनशान्तिश्च सर्पिषि ।।
गन्धवर्णरसोत्पत्तिः स्नेहसिद्धिस्तदा भवेत्। (शा. सं. म. ख. ९/१२-१४)

A small quantity of *kalka* taken out at the end of boiling and rolled in between the fingers, if it assumes a *varthi* (wick-like shape) and does't produce any crackling sound if thrown on fire, it is the test for properly cooked *sneha*. Likewise appearance of *phena* (froth, bubbles) in *taila pāka* and disappearance of *phena* (froth, bubbles) in *ghṛta pāka* takes place at the terminal stage of *sneha pāka* respectively (As mentioned above cows ghee containing saturated fatty acids, because of this specific reason during the preparation of medicated ghee, all the contents *kalka, ghṛta, drava dravya* mixed together and heated continously, at room temperature ghee will be in solid consistency and when it is heated with some liquids it produces such a mixture, due to liquefaction, which recembles (foam) *phena*. Because of specific composition of cows ghee and also its heat resisting capability, from the starting of preparation only the foam is generated and this produced foam will subside at one particular stage, when total water content is get evaporated. Hence our *Ācāryas* mentioned very scientifically disapearance of *phena* (foam) as a significant character among the *sneha siddha lakṣṇas*. This character is quite opposite in the case of medicated oil (*taila*) preparation, because the composition of *taila* is quitly differs from *ghṛta*).

Emission of good smell, colour and taste are the other tests for *sneha pāka* respectively.

Further *Ācārya Śāraṇgadhara* has mentioned different stages of *sneha pāka* on the basis of mode of administration of *sneha kalpanā* and it is mainly divided in to three stages as mentioned below:

स्नेहपाकस्त्रिधा प्रोक्तो मृदुर्मध्यः खरस्तथा ।।
ईषत्सरसकल्कस्तु स्नेहपाको मृदुर्भवेत्। मध्यपाकस्य सिद्धिश्च कल्के नीरसकोमलः ।।
ईषत्कठिनकल्कश्च स्नेहपाको भवेत्खरः। तदूर्ध्वं दग्धपाकः स्याद्दाहकृन्निष्प्रयोजनः ।।
आमपाकश्च निर्वीर्यो वह्निमान्द्योकरो गुरुः। (शा. सं. म. ख. ९.१४-१७)
तुल्ये कल्केन निर्यासे भेषजानां मृदुः स्मृतः। संयाव इव निर्यासे मध्यो दर्वी विमुञ्चति ।।

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शीर्यमाणे तु निर्यासे वर्तमाने खरस्तथा। (च. क. १२.१०३)

Sneha pāka is of three types likewise

1. *Mṛdupāka* (mild), 2. *Madhyamapāka* (moderate), 3. *Kharapāka* (hard boiled).

These *mṛdu, madhyama* and *kharapākas* are the only *pākas* recommended for therapeutic purpose.

These *pākas* will be identified by observing the consistency of *kalka* while doing the preparation of *snehakalpanā*.

Mṛdupāka

A small quantity of *kalka* taken out from the *sneha pātra* and it is pressed in between the fingers, if it yields large quantity of *sneha* (taila or *ghṛta*) then it is said to be *mṛdupāka*. In this stage of *sneha kalpanā*, *kalka* is sticky on touch due to the presence of traces of water, and produces crackling sound when kept on fire. The *sneha* collected at this stage is likely to contain less amount of fat- soluble active principles.

Madhyamapāka

If *kalka* does not yield any *sneha* but is soft in consistence, the *pāka* is *madhyama*. In this state of *sneha kalpanā* when *kalka* put in fire burns without any crackling sound and the *kalka* still remains soft in consistence and non-sticky due to the complete disappearance of water-content. *Kalka* can be made in to varti form in between the fingers, and the *sneha* is also free from water content. The *sneha* collected at this stage is likely to be rich in fat-soluble contents.

Kharapāka

A further degree of heating after *madhyamapāka* leads to *kharapāka*. If the *kalka* does't yield any *sneha* and is hard, rough due to excess of heating then it is said to be *kharapāka* stage.

This is the general concept of all the authours. But *Ācārya Haritā* belongs to *Atreya school* adds one more stage of *sneha kalpanā* by the name of *viśeṣapāka*, which succeeds *kharapāka*.

Vāgbhaṭa (*Aṣṭānga hṛdaya*), *Ṣoḍala (Gadanigraha)*, *Śāraṅgadhara* (*Śāraṅgadhara Saṁhitā*) have mentioned two more stages of *sneha kalpanā*, preceeding and succeding to above three stages *Āmapāka* and *Dagdhapāka*.

Āmapāka

Āmapāka is due to deficient heating, wich is not only ineffective but also causes indigestion. This is the first stage of *sneha kalpanā*. The word *āma* indicates reduced or decreased digestion capacity of *sneha* (*ghṛta* or *taila*). That means, medicated ghee or oil has not sufficiently assimilated the medicinal properties due to short duration of heat treatment of *sneha*. Water content can be seen in both *sneha* and as well as in *kalka* and the fluids are at heterogeneous stage. *Bhāvamiśra* also mentions almost all same openion as *āmapāka* is *guru* and will cause loss of appetite and gastric discomfort.

Dagdhapāka

Boiling still further after *kharapāka* will result in *dagdhapāka* (over burnt), which is not only becomes unworthy but even causes burning sensation by using it. *Bhāvaprakasanighaṇṭu* mentions that, *dagdhapāka sneha* is *vātavardhaka*.

This is the last stage of *sneha kalpanā*, where probably the contents of the *sneha* are burnt leaving it of no use for any therapeutic purpose and this sneha will have the smell of *dagdha sneha*.

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Both *āmapāka* and *dagdha pākas* are not considered for therapeutic use.

Therapeutic uses of different sneha pākas

नस्यार्थं स्यान्मृदुः पाको मध्यमः सर्वकर्मसु । अभ्यङ्गार्थं खरः प्रोक्तो युञ्ज्यादेवं यथोचितम् ।।

(शा. सं. ख. म. ९/१७-१८)

Uses of *mṛdupāka* : For nasya karma (nasal drops).

Vāgabhat,Śāraṅgadhara, Ṣoḍala, Vangasena, Bhāvamiśra, etc. *Ācārayas* all have the same openion. But in *Suśruta saṁhitā, mṛdupāka* is recommended for internal administration.

Uses of *madhyamapāka*: *Madhyamapāka sneha* is ment for all purposes. *Ācārya Caraka* considered *madhyamapāka* as *tridoṣaghna* and can be used for *basti* and *pāna*. *Vāgbhaṭa, Śāraṅgadhara*, and *Bhaisajya ratnāvali* are of the openion that *madhyamapāka* can be given for both external and internal use.

But according to *Suśruta* school of thought, *madhyamapāka* is recommended for nasya *karma* and *abhyanga* (massage).

Uses of *kharapāka* : *Kharapāka* according to *Caraka, Śāraṅgadhara* it is mentioned only for *abhyaṅga* (bath, massage etc. exteranal use) only. Where as *Suśruta* has recommended this *kharapāka* for *vasti* (enemata) and *Karṇapūrana* (otic drops).

Pātrapāka or Gandhapāka

Patrapāka is the process by which the *sneha* is flavoured or augmented by certain solution soluble or miscible substances. The fine powder form of the drugs are placed in the vessel in to which the *sneha* is filtered and mixed well, when *sneha* is lukewarm state. These drugs are generally taken in the quantity of 1/16th part of the *sneha* and all drugs should be taken in equal quantity.To render the *taila* (oil) fragrant usually the following substances are used.

Elā, Gandhaphiroja, Twak, Usturak (storax officinalis), *Lavanga, Pippalimūla, Keśara, Usīra, Tamālapatra, Nakhi* (unguis odoratus), *Srigandha, Khattasi* (pouch of civet cat), *Kumāri, Kastūri* (preputial dried secretion of musk animal), *Jatamansi, Karpuravalli, Ṣaṭi, Saileya, Musta, Kuṣṭa, Kankola, Latakastūri*. For four seers of the *taila*–one *tola* of the each of the ingredients should be taken, with the exception of *karpūra* (camphor) which should be four *tolas*.

Karpūra, kastūri, usturak (*storax*), *nakhi* should be added at the end after the process of *gandhapāka* is over.

In *Bhaiṣajyaratnāvali* for *gandhapāka vidhi* of *taila* specific method is mentioned , as follows.

Manjiṣṭa, nakhi, kankola, nalika, jātikoṣa, twak, kunduruka, karpūra, turuṣka, lavanga, spukka, kumkuma, kastūrti. All these drugs should be collected in equal quantity seperately and all these are mixed, then taken 1/16th part of *taila*. After the preparation of *taila*, respected *gandhadravyas* are collected in mentioned quantity and made in to powder form. This powder is placed over clean cloth and made in to *poṭṭali* (bundle) form by typing with thread. Then this *poṭṭali* is immersed in *taila* for ten days. It should be abserved that, while putting *gandhadravyas, taila* should be in lukewarm state. After the ten days process of *gandhapāka, pottali* is seperated from *taila* and this *taila* is preserved in glass bottles.

Because of doing *gandhapāka* process, *taila* is flavoured or augmented and also its therapeutic efficacy is enhanced.

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Accordidng to different classics this flavouring process of *taila* can be called as *patrapāka* or *gandhapāka*. Most of the times *gandhapāka vidhi* is mentoned for *taila kalpanā* only rather than *ghṛta kalpanā*. It might be because the *tailas* are extensively used external application purpose.

Sūrya Pāka (Āditya Pāka)

It is a specific *pāka* of *Sneha Kalpanā* mentioned by some of the ancient *Āyurvedic Scholars*, where *taila* is heated with mild temperature produced by exposure of sunlight for specific time period. This method is very commonly practiced to prepare *taila Pāka* from the drugs which are having Volatile property and sensitive in nature. This method is also mentioned in some of the books by the name of *Āditya Pāka*.

Idea behind this particular *pāka* is that, to extract the active principles from the sensitive drugs in controlled low temperature.

E.g. 1. *Sūrya Pāka, Kāsīsādi taila* (शा. सं.)

2. *Kuṭaja Patra taila* etc.

Precautions should be taken for the preparation of snehakalpanā

Before the processing of *sneha pāka*: *Sneha* should be pure, clear and without slurry and it should be taken after doing *murchanakarma* only.

In case of *ghṛta* preferably old ghee (*purāṇa ghṛta*) should be taken.

In case of *taila*, it should be new one.

Taila (*Sneha*) *Pātra* should be wide mouthed ,because during the process *taila* may come out , if it is having narrow mouth.

Depending upon the quantity of *sneha*, the size of the *sneha pātra* should be selected.

During the process of *sneha pāka* : Maintain the intensity of fire throughout the operation in order to get desirable grade of temperature.

Gentle boiling of *sneha* is to be maintained contineously. Always *sneha pāka* should be prepared in *mṛdu* and *madyamāgni* only.

In very hot *taila* suddenly *kwātha* should not be poured, if it is poured *taila* may come out from the vessel. Hence while stirring only *kwātha* has to be added slowely.

The mixture is stirred constantly and carefully to ensure that the *kalka* does not stick to the bottom of the vessel resulting in to carbonisation.

Care should be taken to determine the proper stages of *sneha pāka*.

When all the *drava dravyas* have evaporated, the moisture in the *kalka* also becomes to evaporate, at this stage, it has to be stirred more often and carefully to ensure that the *kalka* does not stick to the bottom of the vessel. The *kalka* is taken out from the ladle and tested from time-to-time to know the condition and stage of the *pāka*.

In some particular *sneha kalpanā*, *sārkara*, if mentioned is added to the final product when cool.

Sneha if it is required to prepare with *gomūtra* like *kṣāra dravyas*, then it has to be prepared with atmost care, because *kṣāra* combination with sneha may porduce excessive *phena* (foam). So that the *sneha* may comeout of the *sneha pātra* during *pākāvasta*.

In particular *snehakalpanā* whatever the quantity of *sneha* is mentioned, that much quantity of *sneha* only is supposed to be taken. The quantity should not be altered by increasing or decreasing order.

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Whereever the particular *gaṇa dravyas* (e.g. *jīvanīya gana dravyas* etc.) are mentioned, if all drugs are not available, then *sneha kalpanā* has to be prepared with atleast available drugs.

In the bigining the boiling of *sneha* should be on *mṛdu agni* (mild fire) and in the end also it should be only on mild fire.

Whenever the *saindhavalavaṇa, kṣāra* etc. are mentioned, they should be dissolved in the *kaṣāya* and then *kalka, sneha* should be added.

Where *sarjarasa, madhū-chiṣṭam* (bees was) are mentioned, they should be added only after the *sneha* is filtered or put in the vessel in which the *sneha* is to be filtered.

If in particular formulation, *sneha* quantiy is not mentioned then one *seru sneha* has to be taken and on the basis of *sneha* quantity, the *kalka, drava dravya* quantity also to be estimated.

In particular *sneha* formulation the quantity of contents etc. are clearly mentioned,but quantity may not suites for the basic ratio of *kalka, sneha, dravadravya* (1:4:16) . Even though one has to collect the contents according to quantity prescribed in the particular *sneha* formulation.

In particular *sneha paka prayoga* whatever the quantity of *sneha* is mentioned only that much quantity *sneha* has to be prepared, more or less than that should not be taken.

Both *ghṛta* and *taila* having similar preparation method except slight variation as mentioned below:

Mūrchanavidhi of both *ghṛta* and *taila* are different, the drugs used for *mūrchana* of *ghṛta* and *taila* also differs from each other.

During the process of *taila*, *phena* (foam) generation is mentioned as one of the *siddhilakṣaṇa*. Where as while doing *ghṛta kalpanā*, *phena śānti* (subsiding of *phena*) is mentioned as one of the *siddhilakṣaṇa*.

After sneha pāka process

In order to obtain optimum quantity of *sneha*, the *kalka* should be squeezed (after the *pāka*) at hot stage only. (For this purpose in *Kerala*, the *Vaidyas* are using a particular instrument made by too long wooden pieces, these both wooden pieces are jointed at one end with movable joint and the contents of the *sneha*, including *kalka* are placed in between the wooden pieces nearby joint in the form of *poṭṭali* and compressed with other ends of the wooden pieces, so that the maximum amount of the *sneha* is squeezed out. Idea behind using this instrument is that, in hot stage of taila it is very difficult to extract with hands).

Gandhapāka dravyas should be added gently with stirring, when the *sneha* is in lukewarm state.

Duration of sneha pāka

घृततैलगुडादींश्च साधयेन्नैकवासरे। प्रकुर्वन्त्युषिता ह्येत विशेषाद्गुणसंचयम्।।

(शा. सं. म. ख. ९/१८-१९)

क्षीरे द्विरात्रां स्वरसे त्रिरात्रां तक्रारनालादिषु पञ्चरात्राम्।
स्नेहं पचेद् वैद्यवरः प्रयत्नादित्याहुरेके भिषजः प्रवीणाः।।
द्वादशाहन्तु मूलानां वल्लीनां क्रममेव च। एकाहं व्रीहिमांसानां पाकं कुर्याद्विचक्षणः।।

(वैद्यक परिभाषा प्रदीप ३)

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Preparation of *ghṛta, taila* or *guḍa kalpanās* should not be completed within one day. Longer the duration of preparation better the aqusition of properties of drugs into them. That means the first day after doing *sneha pāka* some time, by giving same intermittent time gap, again next day same *pāka vidhi* has to be continued. During intermittent gap *sneha* has to be kept as it is in container without any change.

Because of longer duration of *sneha* preparation more dissolution of active constituents of the drugs used in the form of *kalka* and *drava dravya*, in to the *sneha* takes place. Thus, the potency of the *taila* or *ghṛta* is expected to be enhaced. The active principles which are present in the *kalka*, *swarasa* etc.may get activated during that state, if contents are kept as it is in container, thus facilitates proper fixation of active principles with *sneha*, hence it is advised that sneha has to be prepared in more than one day.

The duration of *pāka* period depends on the nature of the *drava dravya* added to *sneha* as mentioned below:

Kṣīra- 2 days

Swarasa- 3 days

Takra, aranāla etc. – 5 days

Kwātha prepared with *mūla* and valli –12 days

Vrīhidhānya and *māṁsarasa* –1 day

In some of the classics for *kwātha* – 5 days duration is mentioned.

Here depending upon the nature of *drava dravya*, the time duration of the *sneha pāka* is specifically mentioned because each *drava dravya* will have its own concentration and also releasing capacity of active ingredients into the *sneha*. Hence *Ācāryas* mentioned different time duration according to the *drava dravya*.

Characterstics of prepared sneha

The *ghṛta* will generally solidify when cooled. It will have the colour, odour and taste of the ingredients used.

Taila will have the colour and odour of the drugs used for preparation and generally *taila* will have the consistency of the oil, When considerable quantity of milk is used in the preparation, *taila kalpanā* will become thick due to *ghṛta* and in cold season, may condense further and settle at the bottom.

Method of administration: Generally the anupāna for internal use when not specified then warm milk can be advised. The *ghṛta* has to be warmed and melted before administration. This can be taken with medium of other liquids also as per the indication.

Preservation: *Ghṛta* can be preserved in glass, polythene or aluminium containers and usually tailas are preserved in glass bottles. Usually glass jars (wide mouthed glass containers) are used for packaging purpose of *ghṛtas*, so that it will be convenient to pick up the solidified *ghṛta* with spoon like instrument. Where as for *taila* preservation narrow mouthed glass bottles are used. Sterilized and moisture less containers are supposed to be used for packaging of *sneha kalpanā*.

Expiry date : According to *Ācārya Śāraṅgadhara*, the expiry date of *sneha kalpanā* (*ghṛta* & *taila kalpanā*) is mentioned as sixteen months.

(According to other classics (Pharmacopoeia in *Āyurveda* part-1) *ghṛta* and *taila* preparations for internal use maintains the potency for about sixteen months).

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Note : According to some of the scholors instead of taking water as a *drava dravya*, *dadhi* and *kānjika* together is advised to take in the quantity of 4 times to the *taila*.

Jātyādi Ghṛta

जातीनिम्बपटोलपत्रकटुकादार्वीनिशासारिवामंजिष्ठाभयसिक्थतुत्थमधुकैर्नक्ताहू वबीजान्वितैः।
सर्पिः साध्यमनेन सूक्ष्मवदना ममाश्रिताः क्लेदिनो। गम्भीराः सरूजो व्रणाः सगतयः शुद्धयन्ति रोहन्ति च।
(अष्टांगहृदय, उत्तरस्थान, अध्याय २५/६७-६८)

Ingredients

1. Jātīpatra	-	*2880gm*
2. Nimbaptra	-	*2880gm*
3. Paṭola Patra	-	*2880gm*
4. Kuṭuki	-	*2880gm*
5. Dārvi	-	*2880gm*
6. Nisa	-	*2880gm*
7. Śāriba	-	*2880gm*
8. Manjiṣṭa	-	*2880gm*
9. Abhaya	-	*2880gm*
10. Sikta	-	*2880gm*
11. Tuttha	-	*2880gm*
12. Yaṣṭimadu	-	*2880gm*
13. Karanjabija	-	*2880gm*
14. Ghṛta	-	*11.52lit.*
15. Water	-	*46.08lit*

Anupāna : Water

Therapeutic uses

Kledivraṇa, Gambhiravraṇa, Marmagatavraṇa.

Jātyādi Ghṛta

जातीनिम्बपटोलं च द्वे निशे कटुरोहिणी। मञ्जिष्ठा मधुकं सिक्थं करञ्जोशीरसारिवाः।।
तुत्थं च विपचेत्सम्यक्कल्कैरेभिर्घृतं बुधः। अस्य लेपाद्विरोहन्ति सूक्ष्मनाडीव्रणा अपि।।
मर्माश्रिताः क्लेदिनश्च गम्भीराः सरूजो व्रणाः। (शा. सं. म. ख. ६.५८-६०)

Apparatus Required

Snehapātra, khalva yantra, cloth etc.

Drugs required

1. *Jāti.*
2. *Nimba Patra*
3. *Paṭola Patra.*
4. *Dāru Haridra*
5. *Haridra.*
6. *Kaṭukarohiṇī*
7. *Mañjiṣṭha.*
8. *Madhuka*

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9. *Karañja Patra or bīja*
10. *Uśīra*
11. *Sārivā*
12. *Tutha (Sasyaka)*
13. *Siktha(Madhūchiṣṭa)*
14. *Mūrchita Goghṛta-4 Parts.*
15. *Water-16 Parts.*

Procedure

Above mentioned No.1 to 12 drugs (except *madhūchiṣṭa*) are made in to *kalka* form (with the help of *khalva yantra*) and mixed with 4 parts of *ghṛta*, 16 parts of water in a *sneha pātra* and then according to *sneha pāka vidhi*, *Ghṛta* is prepared over *mandāgni*. When *ghṛta* attains proper *pāka, Madhūchiṣṭa* is to be added and mixed well. Then *ghṛta* is to be filtered and obtained product is called *jatyadi ghṛta*.

Mode of administration : Used for external application only.

Āmayikā prayoga : *Nāḍī Vraṇa, Vraṇa (marma sthāna), Vraṇas* with exudation, *Vraṇas* which are very deep and those painful.

Kṣīra Ṣaṭpala Ghṛta

पिप्पलीपिप्लीमूलचव्यचित्राकनागरैः। ससैन्धवैश्च पलिकैघृतप्रस्थं विपाचयेत् ।।
क्षीरं चतुर्गुणं दत्त्वा तद्घृतं प्लीहनाशनम्। विषमज्वरमन्दाग्निहरं रूचिकरं परम् ।।

(शा. सं. म. ख. ६.१७-१९)

Apparatus required

Sneha pātra, Khalva yantra.

Drugs required

1. *Pippali* : *1 pala*
2. *Pippalīmūla* : *1 pala*
3. *Chavya* : *1 pala*
4. *Citraka* : *1 pala*
5. *Nāgara* : *1 pala*
6. *Saindhava* : *1 pala*
7. *Ghṛta* : *1 praṣtha*
8. *Cow's milk* : *4 prastha*

Procedure

Ghṛta is melted in *sneha pātra*, then cow's milk is added to that, then *kalka* is added , which is prepared from No –1 to No-6 drugs and according to *ghṛta pāka vidhi, ghṛta* is prepared and it is called *Kṣira ṣaṭpala ghṛta* because, here 6 drugs are taken in the measurement of 1 *pala* each. Some of the scholars of *Āyurveda* mentioned this *ghṛta* by the name of *pippalyādi ghṛta*.

Karma : Ṛcikaram

Āmayika Prayoga : Plīhā vṛddhi, Viṣamajwara, mandāgṇi,

Phala Ghṛta

मंजिष्ठाकुष्ठतगर-त्रिफलाशकंरावचाः। द्वे निशे मधुकं मेदा दीप्यकः कटुरोहिणी।।
प्यस्या-हिंगु-काकोली-वाजिगन्धा-शतावरीः। पिष्ट्वाक्षशैवृ तप्रस्थं पचेत्क्षीर चतुर्गुणम्।।

(अष्टांगहृदय, उत्तरस्थान, अध्याय ३५, ६३/६४ १/२)

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Ingredients

1. Manjiṣṭa	-	*180gm*
2. Kuṣṭha	-	*180gm*
3. Tagara	-	*180gm*
4. Haritaki	-	*180gm*
5. Vibhitaki	-	*180gm*
6. Āmalaki	-	*180gm*
7. Śarkara	-	*180gm*
8. Vaca	-	*180gm*
9. Haridra	-	*180gm*
10. Dāruharidra	-	*180gm*
11. Madhuyaṣṭi	-	*180gm*
12. Meda	-	*180gm*
13. Yavāni	-	*180gm*
14. Kaṭurohiṇi	-	*180gm*
15. Vidārikṣīra	-	*180gm*
16. Hingu	-	*180gm*
17. Kākoli	-	*180gm*
18. Vājigandha	-	*180gm*
19. Śatavari	-	*180gm*
20. Ghṛta	-	*11.58kg*
21. Kṣīra	-	*45lit*

Dose : 12gm

Anupāna : Warm water

Therapeutic uses

Bālaroga, Bālagraha, Śukravikāra, Yonivikāra, Vandhyatwa, Garbhiṇiroga.

Saraswata Ghṛta

अजाक्षी सभयाव्योषं-पाठोग्राशिग्रु सैन्धवैः ।

अष्टांगहृदय, उत्तर स्थान, अध्याय (१; ४६)

Ingradients

1. Ajakṣira	-	*45lit*
2. Abhaya	-	*960gm*
3. Śuṇṭhi	-	*960gm*
4. Marica	-	*960gm*
5. Pippali	-	*960gm*
6. Pāṭha	-	*960gm*
7. Vaca	-	*960gm*
8. Śigru	-	*960gm*

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9. Saindhava - *960gm*
10. Water - *12 lit*
11. Ghṛta - *11.5 lit*

Dose : 12 gm.

Anupāna : Warm milk, warm water.

Therapeutic Uses

Improves Voice, Medya, Jaṭharāgnidiptikara.

Triphalā Ghṛta

त्रिफलाया रसप्रस्थं प्रस्थं वासारसोद्भवम।
भृङ्गराजरसप्रस्थं प्रस्थमाजं पयः स्मृतम्। दत्त्वा तत्रा घृतप्रस्थं कल्कैः कर्षमितैः पृथक्।।
त्रिफला पिप्पली द्राक्षा चन्दनं सैन्धवं बला। काकोली क्षीरकाकोली मेदा मरिचनागरम्।।
शर्करा पुण्डरीकं च कमलं च पुनर्नवा। निशायुग्मं च मधुकं सर्वैरिभिर्विपाचयेत्।।
नक्तान्ध्यं नकुलान्ध्यं च कण्डूं पिल्लं तथैव च। नेत्रास्रावं च पटलं तिमिरं काचकं जयेत्।।
अन्येऽपि प्रशमं यान्ति नेत्रारोगाः सुदारूणाः। त्रौफलं घृतमेतद्धि पाने नस्यादिषूचितम्।।

(शा. सं. म. खा. ९/६६-७१)

Apparatus required

Sneha Pātra, Khalva yantra, cloth etc.

Drugs required

Triphalā Kwātha : *1 Prastha*
Vāsa Swarasa : *1 Prastha*
Bhṛingarāja Swarasa : *1 Prastha*
Goats milk : *1 Prastha*
Ghṛta : *1 Prastha*
Kalka dravya :
Triphalā : *1 Karṣa*
Pippalī : *1 Karṣa*
Drākṣa : *1 Karṣa*
Candana : *1 Karṣa*
Saindhava : *1 Karṣa*
Balā : *1 Karṣa*
Kākolī : *1 Karṣa*
Ksira-Kakoli : *1 Karṣa*
Medā : *1 Karṣa*
Marīca : *1 Karṣa*
Nāgara : *1 Karṣa*
Śarkara : *1 Karṣa*

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Puṇḍarika	: *1 Karṣa*
Kamala	: *1 Karṣa*
Punarnavā	: *1 Karṣa*
Niṣādwayam	: *1 Karṣa*
(haridra, dāru haridra)	
Madhūka	: *1 Karṣa*

Procedure

Mūrcchita ghṛta is heated slightly, and triphala *kwātha* is added *Kalka* made of *triphala* to *madhūka* drugs are added and stirred well. Then rest of the *drava dravyas* (*Vāsa swarasa*, *bhṛṅgarāja swarasa*, goats milk) are added and *ghṛta pāka* is done in *mandāgni*. When contents attain proper *ghṛta pāka* vessel is taken out from fire and contents are filtered and obtained *Ghṛta* is called *Triphalā ghṛta*.

Āmayika prayoga

Naktāndhya, nakulāndhya. Kaṇḍu, pilla, netrasrāva, Paṭala, timira, Kāca, and many other severe eye diseases.

Dose : 1\2 to 1 tola.

Mode of administration : It is used internally and also as *naśya.*

Anupāna : *Sukoṣṇa Gokṣīra* mixed with sugarcandy.

Naśya : 4 –4 bindu.

Triphala Ghṛta

त्रिफला ज्यूषणं द्राक्षा मधुकं कटुरोहिणी। प्रपौण्डरीकं सूक्ष्मैला विडंगं नागकेशरम्।।
नीलोत्पलं शारिवे द्वये चन्दनं रजनीद्वयम्। कार्षिकैः प्यसा तुल्यं त्रिगुणं त्रिफलारसम्।।
घृतप्रस्थं पचेदेतत् सर्वनेत्ररूजापहम्। (भै. र. नेत्रारोगाधिकार; १८१-/१८२)

Ingredients

1. Hāritaki	-	*180gm*
2. Vibhitāki	-	*180gm*
3. Āmalaki	-	*180gm*
4. Śuṇṭhi	-	*180gm*
5. Marica	-	*180gm*
6. Pippali	-	*180gm*
7. Drakṣa	-	*180gm*
8. Madhūyāṣṭi	-	*180gm*
9. Kaṭukarohiṇi	-	*180gm*
10. Prapoundarika	-	*180gm*
11. Sūkṣma ela	-	*180gm*
12. Vidaṅga	-	*180gm*
13. Nāgakeśara	-	*180gm*
14. Nilotpala	-	*180gm*

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15. Śwetasāriba	-	*180gm*
16. Kṛṣṇasāriba	-	*180gm*
17. Śwetacandana	-	*180gm*
18. Hāridra	-	*180gm*
19. Dāruharidra	-	*180gm*
20. Ghṛita	-	*11520gm*
21. Kṣīra	-	*11520gm*
22. Triphala Kāwath	-	*34.560lit*

Dose : 12gm

Anupana : Warm Milk, Warm Water

Therapeutic uses

Arbud, Kāmala, Timira, Viṣa, Pradara

Apāmārgakṣāra Taila

मार्गक्षारजले तत्कृतकल्केन साधितं तिलजम् । अपहरति कर्णनादं वाधिर्य्यञ्चापि पूरणतः ।।

(चक्रदत्तः, कर्णरोगे, २६)

Apparatus required

Sneha pātra , cloth, *khalvayantra* etc.

Drugs required

Mūrcçita tilataila	:	*1 lit.*
Apāmārgakṣāra cūrṇa(Kalka purpose)	:	*250 gm.*
Apamārga kṣāra drava	:	*4 lit.*

Procedure

First of all *mūrcçita tila taila* is to be heated, then *apāmārga kṣāra drava* 4 lit. are added and boiled. Then *apāmārga kṣāra* in the form of *kalka* is added and *taila pāka* is done, when all the water content get evaporated, then *taila* is filtered and obtained *taila* is called *apāmārga kṣāra taila*.

For making *apāmārga kṣāra drava*, 100 gms. of *apāmārga kṣāra* is mixed properly in 4 lit. of water and filtered with cloth and obtained liquid is used for the *pāka* of *apāmārga kṣāra taila*.

Pāka parīkṣa : When *phena* is generated in *taila* and broken milk like appearance is found over *taila*, then container has to be taken out from fire and filtered.).

Āmayika prayoga

Karṇanāda, Bāḍirya

Matra: 2 drops to be inistilled in ear.

Bilvādi Taila

बालबिल्वानि गोमूत्रे पिष्ट्रा तैलं विपाचयेत् । साजक्षीरं च नीरं च वाधिर्य हन्ति पूरणात् ।।

(शा. ध. सं. मध्यमखण्ड, ९/१७३-१७४)

Ingredients

1. Apakwabilvaphal - 4.8kg

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2. *Gomūtra*	-	*4.8lit*
3. *Til taila*	-	*19.2lit*
4. *Ajakṣīra*	-	*76.8lit*
5. *Water*	-	*76.8lit*

Method of preparation

Bilvaphala are made into paste form with *gomūtra, ajakṣīra* and water are added then as *tailapāka vidhi, taila* is prepared.

Therapeutic Uses

Bhādirya

Candana Bala Lākṣādi Taila

चन्दनं च बलामूलं लाक्षा लामज्जकं तथा। पृथक्पृथक्प्रस्थमात्रां द्रोणे च सलिले पचेत् ।।
चतुर्भागावशेषऽस्मिस्तैलं प्रस्थद्वयं क्षिपेत्। चन्दनोशीरमधुकशताह्वा: कटुरोहिणी।।
देवदारूनिशाकुष्ठमंजिष्ठागुरूबालकम् । अश्वगन्धा बला दार्वी मूर्वा मुस्ता समूलका:।।
एला त्वङ् नागकुसुमं रास्ना लाक्षा सुगन्धिका। चम्पकं पीतसारं च सारिवा रोचकंद्वयम्।।
कल्कैरेतै: समायुक्तं क्षीराढकस मन्वितम्। (योगरत्नाकर ज्वराधिकार; पृष्ठ २०५)

Ingredients

1. *Candana*	*7680gm*
2. *Balāmūla*	*7680gm*
3. *Lākṣa*	*7680gm*
4. *Lāmajjak*	*7680gm*
5. *Water for Kwātha*	*122.88Lit. reduced to 30.72 Lit.*
6. *Taila*	*15.36kg*
7. *Śweta Candana*	*2560gm*
8. *Uśira*	*2560gm*
9. *Madhūk*	*2560gm*
10. *Śatāhwa*	*2560gm*
11. *Kaṭurohiṇi*	*2560gm*
12. *Devadāru*	*2560gm*
13. *Nisa*	*2560gm*
14. *Kuṣṭa*	*2560gm*
15. *Mñjiṣṭa*	*2560gm*
16. *Aguru*	*2560gm*
17. *Bālaka*	*2560gm*
18. *Aśvagandha*	*2560gm*
19. *Bala*	*2560gm*
20. *Dārvi*	*2560gm*
21. *Mūrva*	*2560gm*

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22. Musta	*2560gm*
23. Mūlaka	*2560gm*
24. Ela	*2560gm*
25. Twak	*2560gm*
26. Nāgakeśara	*2560gm*
27. Rāsna	*2560gm*
28. Lākṣa	*2560gm*
29. Sugandhika	*2560gm*
30. Campaka	*2560gm*
31. Pitasāra	*2560gm*
32. Śāriva	*2560gm*
33. Sauvarcala	*2560gm*
34. Saindhava	*2560gm*
35. Kṣīra	*30.72lit*

Dose : 6 gm

Anupāna : Milk, Luke warm water.

Therapeutic uses

Kāsa, Śwāsa, Kṣaya, Aśṛgdara, Rakta Pitta, Pitta Roga, Kaphaja Roga, Kaṇḍu, Visphoṭaka, Dāha, Śotha, Kāmala, Pāṇḍu Roga, Sarva jwara.

Mahānārayaṇa Taila

बिल्वाश्वगन्धाबृहतीश्वदंष्ट्राश्योनाकवाट्यालकपारिभद्रम् । क्षुद्राकठिल्लातिबलाऽग्रिमन्थं मूलानि चैषां सरणीयुतानाम् ।।
मूलं विदध्यादथ पाटलानां प्रस्थं सपादं विधिनोदधृतानाम् । द्रोणैरपामष्टभिरेव पक्त्वा पादावशेषण रसेन तेन ।।
तैलाढकाभ्यां सममेव दुग्धमाजं निदध्यादथवाऽपि गव्यम् । एकत्रा सम्यग्विपचेत्सुबुद्धिर्दधाद्रसञ्चैव शतावरीणाम् ।।
तैलेन तुल्यं पुनरेव तत्रा रास्नाऽश्वगन्धामिषिदारूकुष्ठम् । पर्णीचतष्कागरुकेशराणि सिन्धूत्थमांसीरजनीद्वयञ्च ।।
शैलेयकं चन्दनपुष्कराणि एलाऽस्त्रायष्टीतगराब्दपत्राम् । भृङ्गाष्टर्गाम्बुवचा पलाशं स्थौणेयवृश्चीरकचोरकाख्यम् ।।
एतैः समस्तैर्द्विपलप्रमाणैरालोड्य सर्व विधिना विपक्कम् । कर्पूरकाश्मीरममृगाण्डजानां चूर्णीकृतानां त्रिपलप्रमाणन् ।।
प्रस्वेददौर्गन्ध्यनिवारणाय दद्यात् सुगन्धाय वदन्ति केचित् । नारायणं नाम महच्च तैलं सर्वप्रकारैर्विधिवत्प्रयोज्यम् ।।
आश्वेव पुंसां पवनार्दितानामेकाङ्गहीनार्दितवेपनानाम् । ये पङ्गवः पीठविसर्पिणश्च वाधिर्यशुक्रक्षयपीडिताश्च ।।
मन्याहनुस्तम्भशिरोरूजार्ता मुक्तामयास्ते बलवर्णयुक्ताः । संसेव्य तैलं सहसा भवन्ति बंध्या च नारी लभते च पुत्राम् ।।
वीरोपमं सर्वगुणोपपत्रां सुमेधसं श्रीविनयान्वितञ्च । शाखाश्रिते कोष्ठगते च वाते वृद्धौ विधेयं पवनार्दितानाम् ।।
जिह्वानिले दन्तगते च शूले उन्माद कौब्जयज्वरकर्शितानाम् । प्राप्नोति लक्ष्मीं प्रमदाप्रियत्वं वपुः प्रकर्ष विजयञ्च नित्यम् ।।
तैलोपसेवी जरयाऽभिमुक्तो जीवेच्चिरं चापि भवेद् युवैव । देवासुरे युद्धपरे समीक्ष्य स्नाय्वस्थिभग्नानसुरैः सुरांश्च ।।
नारायणेनापि सुवृंहणार्थं स्वनामतैलं विहितं च तेषाम् ।। (भै. र. वातव्याधौ)

Apparatus required

Kaṣāya Pātra , Sneha pātra, Stirrer, Khalvayantra.

Drugs required

Kwātha dravya

1. *Bilwamūla twak* : *80 tola*

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2.	*Aśwagandha*	: *80 tola*
3.	*Bṛhatimūla*	: *80 tola*
4.	*Gokṣūra*	: *80 tola*
5.	*Śyonāka mūlatwak*	: *80 tola*
6.	*Balāmūla*	: *80 tola*
7.	*Pāribhadra twak*	: *80 tola*
8.	*Kaṇṭakari*	: *80 tola*
9.	*Punarnavamūla*	: *80 tola*
10.	*Atibalāmūla*	: *80 tola*
11.	*Agnimāntha mūla*	: *80 tola*
12.	*Gandh prasāraṇī*	: *80 tola*
13.	*Pāṭalamūla*	: *80 tola*
14.	*Water*	: *8 drona*
15.	*Mūrchita tila taila*	: *2 aḍhaka*
16.	*Goat milk or cow's milk*	: *2 aḍhaka*
17.	*Śatāvāri kwātha*	: *2 aḍhaka*

Kalka dravya

18.	*Rāsna*	: *2 pala*
19.	*Aśwagandha*	: *2 pala*
20.	*Śata puṣpa*	: *2 pala*
21.	*Kuṣṭa*	: *2 pala*
22.	*Devadaru*	: *2 pala*
23.	*Śaliparṇi*	: *2 pala*
24.	*Pṛśniparṇi*	: *2 pala*
25.	*Māṣaparṇi*	: *2 pala*
26.	*Mudgaparṇi*	: *2 pala*
27.	*Agaru*	: *2 pala*
28.	*Nāgakeśara*	: *2 pala*
29.	*Saindhavalavaṇa*	: *2 pala*
30.	*Jaṭāmāmsī*	: *2 pala*
31.	*Haridra*	: *2 pala*
32.	*Dāru haridra*	: *2 pala*
33.	*Saileyakam*	: *2 pala*
34.	*Rakta candana*	: *2 pala*
35.	*Puṣkaramūla*	: *2 pala*
36.	*Ela*	: *2 pala*
37.	*Mañjiṣṭha*	: *2 pala*
38.	*Musta*	: *2 pala*

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39. *Tejapatra* : 2 *pala*
40. *Bhṛngarāja* : 2 *pala*
41. *Jīvaka* : 2 *pala*
42. *Ṛṣabhaka* : 2 *pala*
43. *Kākolī* : 2 *pala*
44. *Kṣīrakākolī* : 2 *pala*
45. *Meda* : 2 *pala*
46. *Mahāmeda* : 2 *pala*
47. *Ṛddi* : 2 *pala*
48. *Vṛddi* : 2 *pala*
49. *Hrībera(sugandha bāla)* : 2 *pala*
50. *Palāśabīja* : 2 *pala*
51. *Vaca* : 2 *pala*
52. *Ganthi parṇī* : 2 *pala*
53. *Punarnava* : 2 *pala*
54. *Coraka* : 2 *pala*

Procedure

No. 1 to 13 drugs are collected in mentioned quantity and made into *yavakuṭa cūrṇa* form and mixed with mentioned quantity of water and *kwātha* is prepared by reducing the contents over *mandāgni*. *Mūrcita tila taila* is taken in a *sneha pātra* and heated slightly over *madyamāgni* and prepared *kwātha* is added and after that goat milk or cows milk are added, and cooked the contents, when milk is get boiled properly, during that time *śatāvarī kwātha* is added, then all ready prepared *kalka* is added and according to *taila pāka vidhi, taila* is prepared.

While preparing this *taila* it is mentioned that, *kalka* should be added at the end, after adding *taila* and *drava dravya*, In practice some of the experts of *Bhaiṣajaya kalpanā* are adding *kalka* along with *drava dravya* to fascilitate uniform mixing. Above mentioned *kalka dravya* No.-18 to 54 all the drugs should be prepared into fine powder form by pounding and filtering with sieve, then all the powders are mixed together and added the appropriate quantity of water to make it into *kalka* form by grinding. When *taila pāka* is prepared, then vessel has to be taken out from fire and *taila* is filtered with cloth.

When *taila* get cooled, below mentioned *sugandhi dravyas* are added in mentioned quantity and mixed well, then *taila* is packed in glass containers.

Sugandhi dravyas

Karpūra : 1 pala
Keśara : 1 pala
Kastūrī : 1 pala

Because of presence of *sugandhi dravyas* in *mahānārayaṇa taila* it will remove the *śarīra durgandha* (occured because of excesive sweating).

This *taila* can be used for *pāna, bhojya, vasthi* and *abhyanga*. This is a *sugandhita taila*.

Karma : *Balavarna vṛddikaram, santāna karam*. It improves the glossicity of the body, gives happiness to human being, *rasāyana*.

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Āmayika prayoga : *Ekāngavāta, arditavāta, kampavāta, paṇgu, bhādhirya, śukrakṣaya, manyāstambha, hanustambha, śiroroga.* This *taila* is most useful for the treatment of *koṣṭagata vāta, jihwastambha, dantaśūla, unmāda, kubja,* and *kruśatva* caused by *jwara.*

Matra : 1 tola to 4 tola is the *mātra* for internal administration. This can be used for *abhyanga, karṇapūraṇa, nasya etc.* also.

Mahamāṣa Taila (Nirāmiṣa)

द्विपञ्चमूलीं निःक्वाथ्य तैलात् षोडशभिर्गुणैः। माषाढकं साधयित्वा तं निर्व्यूहं चतुर्गुणम्।।
ग्राहयित्वा तु विपचेत् तैलप्रस्थं पयःसमम्। कल्कार्थञ्च समावाप्य भिषग् द्रव्याणि बुद्धिमान्।।
अश्वगन्धा शटीं दारूं बलां रास्नां प्रसराणीम्। कुष्ठं पुरूषकं भार्गी द्वे विदार्यौ पुनर्नवाम्।।
मातुलुङ्गफलाजाज्यौः रामठं शतपुष्पिकाम्। शतावरीं गोक्षुरकं पिप्पलीमूलचित्रकम्।।
जीवनीयगणं सर्वं संहृत्यैव ससैन्धवम्। तत् साधुसिद्धं विज्ञाय माषतैलमिदं महत्।।
वस्त्यभ्यञ्जनपानेषु नावने च प्रयोजयेत्। पक्षाघाते हनुस्तम्भे अर्दिते सापतन्त्रके।।
अवबाहुकविश्वाच्योः खञ्जपङ्गुलयोरपि। हनुमन्याग्रहे चैव अधिमन्थे च वातिके।।
शुक्रक्षये कर्णनादे कर्णशूले च दारूणे। कलायखञ्जशमने भैषज्यमिदमादिशेत्।।
दशमूलाढकं द्रोणे निः क्वाथ्य पादिको भवेत्। क्वाथश्चतुर्गुणस्तैलान्माषक्वाथेऽप्ययं विधिः।।

(चक्रदत्तः वातव्याधौ)

Apparatus required

Khalva yantra, Kaṣāya pātra, Sneha pātra, cloth, vessel etc.

Drugs required

1. *Daśamūla kwāṭha cūrṇa (yavakūṭa cūrṇa)* : *4 āḍhaka*
2. *Māṣa* : *1 āḍhaka*
3. *Mūrcita tila taila* : *1 prastha*
4. *Cows milk* : *1 prastha*

Kalka dravya

5. *Aśwagandha.*
6. *Ṣaṭī*
7. *Devadāru*
8. *Balāmūla*
9. *Rāsna*
10. *Gandhaprasāraṇī*
11. *Kuṣṭa*
12. *Palāsa*
13. *Bhāranghī*
14. *Vidārīkanda*
15. *Kṣīravidārī*
16. *Punarnavāmūla*
17. *Mātulunganimbūphala*
18. *Śwetajīra*
19. *Hingu*
20. *Śata puṣpa*
21. *Śatāvarīmūla*
22. *Gokṣūra*
23. *Pippalīmūla*
24. *Citrakamūla*
25. *Jīvaka*
26. *Ṛṣabhaka*
27. *Kākolī*
28. *Kṣīrakākolī*

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29. *Meda* 30. *Mahāmeda*
31. *Ṛddi* 32. *Vṛddi*
33. *Yaṣṭimadhu* 34. *Jīvantī*
35. *Muḍga parṇī* 36. *Māṣaparṇī*
37. *Saindhava lavaṇa*

Kalka dravya all together (drugs No.-5 to 37) should be taken in 1/4th quantity of *taila* made in to fine powder form and mixed with appropriate quantity of water, again grinded and made in to *kalka* form.

The quantity of *kalka dravya* is not mentioned for *mahāmāṣa taila* hence according to *taila pāka vidhi* 1/4th quantity of *sneha,* can be considered as quantity of *kalka.*

Procedure

Yavakūṭa cūrṇa of daśamūla kwātha cūrṇa are taken in *kaṣāya pātra* and mixed with four times of water and *kwātha* is prepared by reducing the contents in 1\4th quantity over *mandāgni.*

Yavakūṭa cūrṇa of *māṣa* is dissolved in 4 times of water in a *kaṣāya pātra* and kept for one night, then next day morning *kwātha* should be prepared by reducing these contents in to 1/4th quantity over *mandāgni.*

Mūrcita tila taila is taken and heated over *madhyamāgni*, then *daśamūla kwātha* is added and cooked for some time, then *kalka* of drugs N0. 5 to No.37 is added and cooked for some time, then *māṣa kwātha* is added and cooked for some time, after that cows milk is added and cooked the *taila* according to *taila pāka vidhi*. When *taila pāka* is prepared, vessel is taken out and *taila* is filtered. This recipe is called *mahāmāṣa taila* and it is preserved in glass containers.

Uses

This *taila* can be used for *vasti, abhyanga, karṇapūraṇa, naśya* and for internal administration.

Mātra for internal administration- 10 m.l. to 50 m.l.

Āmayika prayoga

Pakṣāghāta, hanustambha, ardita, apatantraka. apbāhuka, viśvācī, khanja, pangu, hanugraha, manyāgraha, adhimantha, śukrakṣaya, karṇanāda, karṇśūla, kalāyakhanja, and vātaroga.

Mahamāṣa Taila (Nirāmiṣa)

दशमूलाढकं पक्त्वा जलद्रोणेऽङिघ्रशोषिते। तद्वन्माषाढकक्वाथे तैलप्रस्थं पयः समम्।।
कल्कैरेतैर्ज्ज मतिमान् साधयेन्मृदुनाऽग्निना। अश्वगन्धा शटीं दारू बलां रास्नां प्रसारणीम्।।
मातुलुङ्गफलाजाज्यौ रामठं शुतपुष्पिकाम्। शतावरीं गोक्षुरकं पिप्पलीमूलचित्रकौ।।
जीवनीयगणं सर्व संहृत्यैव ससैन्धवम्। सत्साधुसिद्धं विज्ञाय माषतैलमिदं महत्।।
बस्त्यभ्यञ्जनपानेषु नावनेषु प्रशस्यते। पक्षाघाते हनुस्तम्भे अदिते सापतन्त्रके।।
अववाहुकविश्वाच्योः खञ्जपाङ्गुल्ययोरपि। शिरोमन्याग्रहे चैव अधिमन्थे च वातिके।।
शुक्रक्षये कर्णनादे कर्णदवेडे च दारूणे। कलायखञ्जशमने भैषज्यमिदमादिशेत्।।

(भै. र. वातव्याधिचिकित्सा प्रकरणम् २६ / ५७८-५८४)

Ingredients

1. *Daśamūla kwāth* *46kg 80gm*

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2. Māṣa kwāth	-	46kg 80gm
3. Tiltaila	-	11520gm
4. Godugha	-	11520gm
5. Aśwagandha	-	84gm
6. Kacūr	-	84gm
7. Devdāru	-	84gm
8. Bala	-	84gm
9. Rāsna	-	84gm
10. Prasaraṇi	-	84gm
11. Kuṣṭa	-	84gm
12. Pālsa	-	84gm
13. Bhṛngaraj	-	84gm
14. Vidarikand	-	84gm
15. Kṣīravidārī	-	84gm
16. Punarnavāmūla	-	84gm
17. Nimbuphalamajja	-	84gm
18. Śwetajīra	-	84gm
19. Hingu	-	84gm
20. Somph	-	84gm
21. Śatāvarimūla	-	84gm
22. Gokṣūra	-	84gm
23. Pippalimūla	-	84gm
24. Citrakamūla	-	84gm
25. Jīvaka	-	84gm
26. Vṛsabhak	-	84gm
27. Meda	-	84gm
28. Mahameda	-	84gm
29. Kakoli	-	84gm
30. Kṣīrakakoli	-	84gm
31. Ṛddhi	-	84gm
32. Vṛddhi	-	84gm
33. Mūlethi	-	84gm
34. Jīvantī	-	84gm
35. Mudgaparṇi	-	84gm
36. Māṣaparṇī	-	84gm
37. Saindhav	-	84gm

Therapeutic uses

Pakṣāghāta, Hanustambha, Ārditavata, Āpatantra, Āvabahuk, Viswaci, Khanj, Pangulya, Śirograha, Mānyagraha, Vātikādhimāndh, Sukrakṣāya, karnanād, Kalayakhanj, Dāruṇakarṇakṣweda.

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Mahamāṣa Taila (Sāmiṣa)

माषस्यार्धाढक दत्त्वा तुलार्द्धं दशमूलतः। पलानिच्छागमांसस्य त्रिंशद्द्रोणेऽम्भसः पचेत्।।
पूते शीते कषाये च चतुर्थांशावतारिते। प्रस्थं च तिलतैलस्य पयो दत्त्वा चतुर्गणम्।।
आत्मगुप्तोरूबूकश्च शताह्वा लवणत्रयम्। जीवनीयानि मञ्जिष्ठा चव्यचित्रककट्फलम्।।
सव्योषं पिप्पलीमूलं रास्ना मधुकसैन्धवम्। देवादार्वमृता कुष्ठं वाजिगन्धा वचा शटी।।
एतैरक्षसमैः कल्कैः साधयेन्मृदुनाऽग्निना। पक्षाघातार्दिते वाते वाधिर्य्ये हनुसंग्रहे।।
कर्णनादे शिरः शूले तिमिरे च त्रिदोषजे। पाणिपादशिरोग्नीवाभ्रमणे मन्दचङ्क्रमे।।
कलायखञ्जे पाङ्गुल्ये गृध्रस्यामवबाहुके । पाने बस्तौ तथाऽभ्यङ्गे नस्यकर्णाक्षिपूरणे।।
तैलमेतत्प्रशंसन्ति सर्ववातरूजापहम्। महामाषमिदं तैलं सर्ववातविकारनुत्।।

(चक्रदत्तः वातव्याधौ)

Apparatus required

Khalva yantra, Kaṣāya pāṭra, Sneha pāṭra, cloth etc.

Drugs required

1 *Daśamūla yavakūṭa curṇa*
2. *Ajāmāṁsa (goat meat)*
3. *Water for preparation of kwātha*
4. *Cow's milk – 4 prastha*
5. *Māṣa yavakūṭa cūrṇa*
6. *Murcita tila taila- 1 prastha*
7. *Water for boiling the ajāmāṁsa*

Kalka dravya

8. *Āthma gupta*
9. *Eraṇḍa mūla twak*
10. *Śata puṣpa*
11. *Saindhavalavaṇa*
12. *Sauvarcha lavaṇa*
13. *Viḍa lavaṇa*
14. *Jīvaka*

Procedure

Māṣa and *daśamūla* are prepared in to *yavakūta cūrṇa* and dissolved in mentioned quantity of water in a *kaṣāya pātra* and kept as it is for one night and next day these contents are reduced into 1/4th quantity over *madhyamāgni* according to *kwātha vidhi*. *Kwātha* is filtered and kept ready. *Ajamāṁsa* is collected and mixed with mentioned quantity of water till it get reduced to 1\4th part then *māmsa rasa* is filtered and kept ready.

Mūrcita tila taila is taken in a *sneha pātra* and heated over *madhyamāgni* then already prepared *kwātha* is added and mixed well, after that cows-milk is added. While adding *kwātha* etc. *dravadravyas*. *Kalka* of above mentioned drugs No8 to No 14 are to be added and mixed well, then *taila* is prepared according to *taila pāka vidhi*. After attaining *pāka parīkṣa*, *sneha pātra* has to be taken out from the fire and *taila* is filtered immediately and obtained *taila* is preserved in glass bottles. This recipe is called *mahamāṣataila*.

Uses

This *mahamāṣa taila* can be used for internal administration, *abhyanga, vasti, karṇa pūraṇa, naśya karma* etc.

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Āmayika prayoga

Pakṣāghāta, ardita, bādhirya, hanugraha, karṇanāda, śirah śūla, timira, hastakampa, pādakampa, śirahkampa, grīvākampa, kalāyakhanja, pangu, gṛdhrasī, apabāhuka, and all varities of vātaroga.

Maricādya Taila

मरिचालशिलाब्दार्कपयोऽश्वारिजटा त्रिवृत। शकद्रसविशाला रूङनिशायुग्दारूचन्दनैः।।
कटुतैलात्पचेत्प्रस्थ द्वयक्षैर्विषपलान्वितैः। सगोमूत्रैस्तदभ्यङ्गात् दद्रुश्वित्राविनाशनम्।
सर्वेष्वपि च कुष्ठषु तैलमेतत्प्रशस्यते। (भै. र. कुष्ठाधिकार; १७४-१७५)

Ingradients

1. Sarṣap Taila	-	*1 ser*
2. Śuddha Vatsanābha	-	*5 tola*
3. Gomūtra	-	*4 ser*
4. Marica	-	*2 karṣa*
5. Haritāla	-	*2 karṣa*
6. Manahśila	-	*2 karṣa*
7. Musta	-	*2 karṣa*
8. Arkakṣīra	-	*2 karṣa*
9. Karavīra	-	*2 karṣa*
10. Jaṭamāṁsi	-	*2 karṣa*
11. Trivṛt	-	*2 karṣa*
12. Gomayaras	-	*2 karṣa*
13. Indravāruṇi	-	*2 karṣa*
14. Kuṣṭa	-	*2 karṣa*
15. Haridra	-	*2 karṣa*
16. Dāruharidra	-	*2 karṣa*
17. Devadāru	-	*2 karṣa*
18. Śweta Candan	-	*2 karṣa*

Therapeutic Uses

Dadru, Śvitra, Kuṣṭha.

Nārayaṇa Taila

बिल्वाग्निमन्थरयोनाकपाटलापारिभद्रकम्। प्रसारण्याश्वगन्धा च बृहती कण्टकारका।।
बला चातिबला चैव श्वदष्टा सपुनर्नवा। एषां दशापलान् भागांश्चतुद्रोण्डम्भसः पचेत्।।
पादशेंषं परिस्त्राव्य तैलापात्रं प्रदापये त्। शतपुष्पा देवदारू मांसी शैलेवकं वचा।।
चन्दनं तगरं कुंष्ठमेला पर्णीचतुष्टयम्। रास्ना तुरगगन्धा च सैन्धवं सपुनर्नवम्।।
एषां द्विपालिकान भागान् पेषयित्वा विनिषिपेत्। शतावरी रसन्चैव तैलतुल्यं प्रदापतेत्।।
अजां वा यदि वा गव्यं क्षिर दद्याच्चतुर्गुणम्। (भै. र. वातव्याध्यधिकार; १४०-१४४, १/२)

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Ingredients

1. Bilwa	-	*1920gm*
2. Agnimantha	-	*1920gm*
3. Śyoṇāka	-	*1920gm*
4. Pāṭala	-	*1920gm*
5. Pāribhadra	-	*1920gm*
6. Prasāraṇi	-	*1920gm*
7. Aśvagandha	-	*1920gm*
8. Bṛhati	-	*1920gm*
9. Kaṇṭakāri	-	*1920gm*
10. Bala	-	*1920gm*
11. Atibala	-	*1920gm*
12. Svadamṣṭra	-	*1920gm*
13. Punarnava	-	*1920gm*
14. Water for Kwātha	-	*196lit Reduced to -49lit*
15. Taila	-	*12lit*
16. Śatapuṣpa	-	*384gm*
17. Devadaru	-	*384gm*
18. Māṁsi	-	*384gm*
19. Saileyaka	-	*384gm*
20. Vaca	-	*384gm*
21. Candana	-	*384gm*
22. Tagara	-	*384gm*
23. Kuṣṭa	-	*384gm*
24. Ela	-	*384gm*
25. Śāla parni	-	*384gm*
26. Pṛṣṇi parni	-	*384gm*
27. Mudga parni	-	*384gm*
28. Māṣa parni	-	*384gm*
29. Rāsna	-	*384gm*
30. Aśvagandha	-	*384gm*
31. Saindhava	-	*384gm*
32. Punarṇava	-	*384gm*
33. Śatāvari rasa	-	*12lit*
34. Gavya kṣīra	-	*48lit*

Dose : 6gm for *naśya*

Anupāna : Warm water,milk

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Therapeutic Uses

Vātaroga, Pangu, Śirogatavāta, Manyāstambha, Hanustambha, Danta roga also used for abhyanga and *Anuvāsana vasti.*

Pañca Guṇa Taila

Ingredients

1. Tila taila	-	*32Parts*
2. Guggulu	-	*1Part*
3. Śilāras	-	*1Part*
4. Śriveṣṭak	-	*1Part*
5. Śiktha	-	*1Part*
6. Rāl	-	*1Part*
7. Triphala	-	*3Parts*
8. Nirguṇḍipatra	-	*3Parts*
9. Nimbapatra	-	*3Parts*
10. Karpūr	-	*1Part*
11. Water	-	*128 Parts*

Therapeutic uses

Sandhivāt, Pakṣāghat, Vātikśūla.

Ṣaḍbindu Taila

एरण्डमूलं तगरं शताह्वा जीवन्ति रास्ना सह सैन्धवं च । भृङ्गं विडङ्गं मधुयष्टिका च विश्वौषधं कृष्णतिलस्य तैलम् ।।
आजं पयस्तैलविमिश्रितञ्च चतुर्गुणे भृङ्गरसे विपक्वम् । षड्बिन्दवो नासिकयोर्निधेया निहन्ति शीघ्रं शिरसो विकारान् ।।
च्युतांश्च केशांश्चलितांश्च दन्तान् दुर्बद्धमूलांश्च दृढीकरोति । सुपर्णदृष्टिप्रतिमञ्च चक्षुर्बाह्वोर्बलञ्चाप्यधिकं ददाति ।।
(भै० र० शिरोरोगे)

Apparatus required:

Sneha pātra, khalva yantra, cloth etc.

Drugs required

1. *Mūrchita kriṣna tila taila*	:	*4 lit.*
2. *Goat milk,*	:	*4 lit*
3. *Bhringarāja swarasa*	:	*16 lit.*

Kalka Dravya

4. *Eranda mūla twak*	:	*15 g.*
5. *Tagara*	:	*15 g.*
6. *Śata puṣpa*	:	*15 g.*
7. *Jivanthi*	:	*15 g.*
8. *Rāsna*	:	*15 g.*
9. *Saindhava lavaṇa*	:	*15 g.*

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10. Ārdhraka	:	*15 g.*
11. Viḍanga	:	*15 g.*
12. Yaṣṭimadhu	:	*15 g.*
13. Śuṇṭhi	:	*15 g.*

Procedure

Above mentioned *kalka dravya* (no.-4 to no.-13 all are powdered and added little bit of water, grinded and *kalka* is prepared. *Tila taila* is taken in a *sneha pātra* and heated over *mandāgni* till water content of *taila* is get evaporated then goat milk is added and heated when half of the quantity of milk is get evaporated then *kalka* of above mentioned drugs (No. – 4 to No. – 13) and *bhringarāja swarasa* is mixed, then *mṛdu taila pāka* is prepared after that vessel is taken out from the fire and *taila* is filtered with a cloth and after *swānga śītala taila* is preserved in glass container . It is advised that this *taila* can be prepared in 2 or 3 days, then only good efficacious *taila* will be produced.

Karma- *keśya, danta dhārdya karam, bāhubala karam, cakṣuṣyam.*

Āmayika prayoga : All varities of śiroroga, hair loss dantaroga, netraroga.

Dose : 6 bindus (used as nasal drops).

The dose of this recipe is 6 bindus hence it is called *ṣadbindu taila.*

Somarāji Taila

सोमराजी हरिद्रे दूबे सर्षपा: कुष्ठमेव च। करंजैड गजाबीजं पन्नाण्यारग्वधस्य च।।
विपचेत्सार्षपं तैलं नाडीदुष्टव्रणापहम्। (भै. र. कुष्ठाधिकार; २०८ १/२)

Ingredients

1. Somarāji (bākuci)	-	*360gm*
2. Haridra	-	*360gm*
3. Dāru haridra	-	*360gm*
4. Sarṣapa	-	*360gm*
5. Kuṣṭha	-	*360gm*
6. Karanja bija	-	*360gm*
7. Chakramarda bija	-	*360gm*
8. Aragvadha patra	-	*360gm*
9. Sarṣapa taila	-	*11.5lit*
10. Water	-	*12 litre*

Therapeutic uses

Kaṇḍu, Kacchu, Pāma, Piḍaka, Nilika, Duṣṭa Vraṇa, Vata Rakta, Vyanga, Kuṣṭha.

Triphala Taila

त्रिफलामृतवल्लीं च केतक्यसनकौ बलाम्। एरण्डीमन्द्रवल्लीं च जलद्रोणे विपाचयेत्।।
रसेन तेकराजस्यहठस्य स्वरसेन च। तैलप्रस्थं पचेद्धीनमान् द्विगुणपक्षी रसंयुतम्।।
कल्कंच कुष्ठयष्ट्याह्वपद्मकोशीरचन्दनैः। मुस्तैला पत्रमांसी च हयगन्धा बलामृता।।

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शारिवामरकाष्ठंच लवंगनतचोरकाः। उत्पलाद्यंजने नीलोश्लक्ष्णपिष्टान् समावषेत्।।

(सहस्त्रयोग; तैल प्रकरण; ४४)

Ingredients

1. Haritaki	-	*11520gm*
2. Vibhitaki	-	*11520gm*
3. Āmalaki	-	*11520gm*
4. Guḍūci	-	*11520gm*
5. Ketakimūla	-	*11520gm*
6. Asana	-	*11520gm*
7. Bala	-	*11520gm*
8. Eraṇḍamūla	-	*11520gm*
9. Indravalli	-	*11520gm*
10. Water for decoction	-	*184.320lit reduced to - 45lit*
11. Bhṛngarāj Swaras	-	*11.5lit*
12. Āmalaki Swaras	-	*11.5lit*
13. Taila	-	*11.5lit*
14. Kṣīra	-	*23lit*
15. Kuṣṭha	-	*1920gm*
16. Yaṣṭyāhva	-	*1920gm*
17. Padmak	-	*1920gm*
18. Uśira	-	*1920gm*
19. Śwetacandana	-	*1920gm*
20. Musta	-	*1920gm*
21. Ela	-	*1920gm*
22. Patra	-	*1920gm*
23. Jaṭamāṁsi	-	*1920gm*
24. Aśwagandha	-	*1920gm*
25. Bala	-	*1920gm*
26. Guḍūci	-	*1920gm*
27. Śāriba	-	*1920gm*
28. Devadāru	-	*1920gm*
29. Lavanga	-	*1920gm*
30. Tagara	-	*1920gm*
31. Ṣaṭhi	-	*1920gm*
32. Śwetārkamūla	-	*1920gm*
33. Raktārkamūla	-	*1920gm*
34. Kumuda	-	*1920gm*
35. Kalahar	-	*1920gm*

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36. Padma - 1920gm
37. Anjan - 1920gm
38. Nili - 1920gm

Therapeutic uses

Pratiśyaya, Khālitya, Pālitya, Keśapata, Śiroroga, Ūrdhwajatrugataroga.

Viṣagarbha Taila

धतूरस्य रसस्य पंचकुडवं तैलं तथा कांजिकम् । प्रस्थानां च चतुष्टयं गदवचा त्रिशत्परं शाणकाःत् ।।
ह्यद्धात्रीमरिचात्पुथङनव विषात् षटस्वर्णवीजात् पटोः ।
स्यु सप्ताधिकविशतिः परिमितं तीव्रानिकध्वंसनम् ।।

(भै. र. वातव्याध्याधिकार ४११-४१२)

Ingredients

1. Dhaṭṭur ras - 3.84lit
2. Til taila - 12lit
3. Kāñji - 12lit
4. Kuṣṭa - 480gm
5. Vaca - 480gm
6. Bhūmyāmalaki - 144gm
7. Marica - 144gm
8. Suddhavatsanabh - 96gm
9. Dhatturbija - 432gm
10. Saindhava - 432gm

Therapeuitic Uses

Pakṣāghāt, hanustambhamanyastambh, katigraha, pṛṣṭakamp, trikakamp, śirahkampa, sarvāngagrahaṇa.

Some of the Ghrta Kalpanā with their reference

Formulation	Reference
1. Amṛta Ghṛta	Cakradatta, Āmavātacititsā
2. Amṛtaprāśa Ghṛta	Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya - 3
3. Amṛta Bhallātaka Leha (Amṛta Bhallātaka pāka)	Aṣṭāṅgahṛdaya Uttarasthāna, Adhyāya - 39
4. Aśoka Ghṛta	Bhaiṣajyaratnāvalī, Strīrogādhikāra
5. Indukānta Ghṛta	Sahasrayoga, Ghṛtaprakaraṇa
6. Elādi Ghṛta	Aṣṭāṅgahṛdaya, Cikitsasthāna, Adhyāya - 5
7. Kalyāṇaka Ghṛta	Aṣṭāṅgahṛdaya, Uttarasthāna, Adhyāya - 6
8. Kāsīsādi Ghṛta	Śārṅgadharasaṁhitā, Madhyamakhaṇda, Adhyāya 9
9. Cāṅgerī Ghṛta	Bhaiṣajyaratnāvalī, Grahaṇīrogādhikāra
10. Chāgalādya Ghṛta	Bhaiṣajyaratnāvalī, Rājayakṣmādhikāra

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11. Jātyādi Ghṛta	*Aṣṭāṅgahṛdaya, Uttarasthāna, Adhyāya 25*
12. Jīvantyādi Ghṛta	*Aṣṭāṅgahṛdaya Uttarasthāna, Adhyāya 13*
13. Tiktaka Ghṛta	*Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya 19*
14. Triphalā Ghṛta	*Bhaiṣajyaratnāvalī, Netrarogādhikāra*
15. Traikaṇṭaka Ghṛta	*Sahasrayoga, Ghṛtaprakaraṇa*
16. Daśamūla Ghṛta	*Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya 3*
17. Daśamūla ṣaṭpalaka Ghṛta	*Cakradatta, Jvaracikitsā*
18. Daśamūla ṣaṭpalaka Ghṛta	*Cakradatta, Udaracikitsā*
19. Dāḍimādi Ghṛta	*Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya 16*
20. Dādhika Ghṛta	*Aṣṭāṅgahṛdaya, Cikitsasthāna, Adhyāya 14*
21. Dhātryādi Ghṛta	*Sahastrayoga, Ghṛtaprakaraṇa*
22. Dhānvamtara Ghṛta	*Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya 12*
23. Nārasimha Ghṛta	*Aṣṭāṅgahṛdaya, Uttarasthāna, Adhyāya 39*
24. Nirguṇḍī Ghṛta	*Cakradatta, Rājayakṣmacikitsā*
25. Pañcagavya Ghṛta	*Aṣṭāṅgahṛdaya Uttarasthāna Adhyāya 18*
26. Pañcatikta Ghṛta	*Bhaiṣajyaratnavālī, Kuṣṭhādhikāra*
27. Pañcatikta Guggulu Ghṛta	*Aṣṭāṅgahṛdaya, Cikitsāsthana, Adhyāya 21*
28. Paṭolādi Ghṛta	*Aṣṭangahṛdaya, Cikitsāsthāna, Adhyāya 1*
29. Phala Ghṛta (Phala sarpi)	*Aṣṭāṅgahṛdaya, Uttarasthāna, Adhyāya 34*
30. Bṛhat Phala Ghṛta	*Śārāṅgadhara Saṁhitā, Madhyamakhaṇḍa, Adhyāya 9*
31. Brāhmī Ghṛta	*Aṣṭāṅgahṛdaya, Uttarasthāna, Adhyāya 6*
32. Mahā Kalyāṇaka Ghṛta	*Aṣṭāṅgahṛdaya, Uttarasthāna, Adhyāya 6*
33. Mahā Tiktaka Ghṛta	*Bhaiṣajyaratnāvalī, Kuṣṭhādhikāra*
34. Mahā Triphalādya Ghṛta	*Bhaiṣajyaratnāvalī, Netrarogādhikāra*
35. Mahā Pañcagavya Ghṛta	*Aṣṭāṅgahṛdaya, Uttarasthāna, Adhyāya 7*
36. Miśraka Sneha	*Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya 14*
37. Laśunādi Ghṛta	*Aṣṭāṅgahṛdaya , Cikitsāsthāna, Adhyāya 14*
38. Vajraka Ghṛta	*Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya 19*
39. Vistyāmayāntaka Ghṛta	*Sahasrayoga, Ghṛtaprakaraṇa*
40. Vidāryādi Ghṛta	*Aṣṭāṅgahṛdaya, Sūtrasthāna, Adhyāya 15*
41. Saṭpala Ghṛta (Pañcakolādi Ghṛta)	*Aṣṭāṅgahṛdaya, Cikitsāsthāna , Adhyāya 5*
42. Sārasvata Ghṛta	*Aṣṭāṅgahṛdaya Uttarasthāna, Adhyāya 1*
43. Sukumāra Ghṛta	*Sahasrayoga, Ghṛtaprakaraṇa*

Some of the Taila Kalpana with their reference

Formulation	*Reference*
1. Aṇu Taila	*Aṣṭāṅgahṛdaya, Sūtrasthāna Adhyāya 30*
2. Arimedādi Taila	*Aṣṭāṅgahṛdaya, Uttarasthāna Adhyāya 22*

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3. Asanavilvādi Taila	Sahasrayoga, Tailaprakaraṇa
4. Kanaka Taila	Bhaiṣajyaratnāvalī, Kṣudrarogādhikāra
5. Kayyonnyādi Taila	Sahasrayoga, Tailaprakaraṇa
6. Kārpāsāsthyādi Taila	Sahasrayoga, Tailaprakaraṇa
7. Kāsīsādi Taila	Bhaiṣajyaratnāvalī, Arśorogadhikāra
8. Kuṅkumādi Taila	Yogaratnākara, Kṣudrarogādhikāra
9. Kuṣṭharākṣasa Taila	Bhaiṣajyaratnavalī, Kuṣṭharogādhikāra
10. Koṭṭamcukkādi Taila	Sahasrayoga, Tailaprakaraṇa
11. Kṣīrabalā Taila	Aṣṭāṅgahṛdaya , Vātaraktacikitsā, Adhyāya 22
12. Gandharvahasta Taila	Aṣṭāṅgasaṅgraha, Cikitsāsthāna Adhyāya 15
13. Grahaṇīmihira Taila	Bhaiṣajyaratnāvalī, Grahaṇīrogādhikara
14. Candanādi Taila	Yogaratnākara, Rājayakṣmācikitsā
15. Candana balālākṣādi Taila	Yogaratnakāra, Jvarādhikāra
16. Citrakādi Taila	Suśrutasaṁhitā, Bhagandaracikitsā
17. Jātyādi Taila	Śārṅgadharasamhitā, Madhyama Khaṇḍa, Adhyāya 9
18. Jyotiṣmatī Taila	Yogaratnākara, Kuṣthacikitsā
19. Tuṅgadrumādi Taila	Sahasrayoga, Taila prakarana
20. Tuvaraka Taila	Suśrutasaṁhitā, Cikitsāsthāna, Adhyāya 13
21. Triphalādi Taila	Sahasrayoga, Taila prakarana
22. Dhānvantara Taila (Balā Taila)	Vaidyayogaratnāvati, Tailaprakaraṇa
23. Nārāyaṇa Taila	Bhaiṣajyaratnāvalī, Vātavyādhyadhikāra
24. Nālpāmarādi Taila	Sahasrayoga, Tailaprakaraṇa
25. Nīlīkādya Taila	Śārṅgadharasaṁhitā Madhyamakhaṇḍ, Adhyāya 9
26. Nīlībhṛṅgādi Taila	Sahasrayoga, Tailaprakaraṇa
27. Pariṇatakeri kṣīrādi Taila	Sahasrayoga Tailaprakaraṇa
28. Piṇḍa Taila	Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya 22
29. Pippalyādi Taila	Bhaiṣaajyaraṭnāvalī, Arśorogādhikāra
30. Prabhañjana Vimardana Taila	Sahasrayoga, Tailaprakaraṇa
31. Pramehamihira Taila	Bhaiṣajyaratnāvalī, Pramehādhikāra
32. Prasāriṇī Taila	Śārṅgadharasaṁhitā, Madhyamakhaṇḍa, Adhyāya 9
33. Balā Taila	Aṣṭāṅgahṛdaya, Cikitsāshāna, Adhyāya 21
34. Balāguḍūcyādi Taila	Sahasrayoga, Tailaprakaraṇa
35. Balādhātryādi Taila	Sahasrayoga, Tailaprakaraṇa
36. Balāśvagandhalākṣādi Taila	Sahasrayoga, Tailaprakaraṇa
37. Balāhaṭhādi Taila	Sahasrayoga, Tailaprakaraṇa
38. Bṛhat Guḍūcī Taila	Bhaiṣajyaratnāvalī, Vātaraktādhikāra
39. Bṛhat Māṣa Taila	Bhaiṣajyaratnāvalī, Vātavyādhyadhikāra
40. Bṛhat Saindhavādya Taila	Bhaiṣajyaratnāvalī, Āmavātādhikāra
41. Bhṛṅgāmalakādi Taila	Sahasrayoga, Tailaprakaraṇ

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42. *Vgṛṅgarāja Taila*	*Bhaiṣajyaratnāvalī, Kṣudrarogādhikāra*
43. *Mañjiṣṭhādi Taila*	*Sahasrayoga, Tailaprakaraṇa*
44. *Madhuyaṣṭyādi Taila*	*Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya 22*
45. *Mahā Nārāyaṇa Taila*	*Bhaiṣajyaratnāvalī, Vātavyādhyadhikāra*
46. *Mahā Viṣagarbha Taila*	*Bhaiṣajyaratnāvalī, Vātavyādhyadhikāra*
47. *Yaṣṭīmadhuka Taila*	*Śāraṅgadharasaṁhitā, Madhyamakhaṇḍa, Adhyāya 9*
48. *Laghu Viṣagarbha Taila*	*Bhaiṣajyaratnāvalī, Vātavyādhyadhikāra*
49. *Lākṣādi Taila*	*Bhaiṣajyaratnāvalī Jvarādhikāra*
50. *Lāṅgalī Taila (Nirguṇḍī Taila)*	*Śārṅgadharasaṁhitā, Madhyamakhaṇḍa Adhyāya 9*
51. *Vacādi Taila*	*Aṣṭāṅgahṛdaya, Uttarasthāna Adhyāya 30*
52. *Vacā Laśūnādi Taila*	*Sahastrayoga, Tailaprakaraṇa*
53. *Vajraka Taila*	*Aṣṭāṅgāhṛdaya, Cikitsāsthāna, Adhyāya 9*
54. *Vāśācandanādi Taila*	*Bhaiṣajyaratnāvalī, Tailaprakaraṇ*
55. *Viṣatinduka Taila*	*Bhaiṣajyaratnāvalī, Vātaraktādhikāra*
56. *Vraṇarākṣasa Taila*	*Bhaiṣajyaratnāvalī, Vraṇaśothādhikāra*
57. *Śuṣkamūlaka Taila*	*Bhāvaprakāśa, Śothādhikāra*
58. *Ṣaḍabindu Taila*	*Bhaiṣajyaratnāvalī, Śirorogādhikāra*
59. *Sahacarādi Taila*	*Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya 21*
60. *Saindhavādi Taila*	*Bhaiṣajyaratnāvalī, Nāḍīvraṇādhikāra*
61. *Somarāji Taila*	*Bhaiṣajyaratnāvalī, Kuṣṭhādhikāra*
62. *Hiṅgutriguṇa Taila*	*Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya 14*

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Chapter 20

SANDHĀNA KALPANĀ (ALCOHOLIC PREPARATIONS)

Historical Background

It has been stated that *āsava- ariṣṭa kalpanās* are the out come of *sandhāna* process.

The origin of *Āsava- ariṣṭa kalpanā* can be traced from the pre-historic period, as sufficient recognizable references are available in *atharva veda, ṛgveda* and *yajurveda*, which support the views, that the process of *sandhāna* and the uses of the products of *sandhāna*. Here commonly known in the period, of *caraka saṁhitā* the science and arts of *sandhāna* was properly defined and fairly developed various kinds of preparations example- *āsavas, ariṣṭa, surāsavas* were thoroughly described on the basis of *dravya* and its *yoni*. *Samyoga* (combination) and *samaskāra* etc., because the process of *sandhāna* is involved in their preparations, heance they are grouped as *madhyavarga*. *Ācārya suśruta* and *kāśyapa* have added more preparations in the group by developing further eloboration of the principles and techniques of *sandhāna*.

During *saṅgraha* period the classical literature of *āsava-ariṣṭa-kalpanā* was merely compiled, reclassified and arranged in proper manner. *Śāraṅgadhara* in his *saṁhitā* added new features too and collected from other sources and contemporary literature and interpretations of *sandhāna* process.

The technique of distillation of *āsava* and *ariṣṭa* with the help of *kachapa yantra* and fixation of the standard methods in the variations of the processes of *āsava* and their definition etc were also thoroughly described by *Ācārya Sāraṅgadhara*.

Definition

If the liquid substances like sugarcane juice, *kaṣāyas* are mixed with *anna*, *guḍa*, *kinva* and kept for some time then this procedure is called *sandhāna*.

The term *sandhāna* has a number of synonyms, of which the most significant is *abhiṣavana* or *abhiṣava*. In its broder sence, the term *sandhāna* denotes the process of acceleration of chemical and biochemical reactions which may be classified from *Āyurvedic* point of view under two main heads viz. *Samyoga* and *vibhāga*.

पेयं यन्मादकं लोकैस्तन्मद्यमभिधीयते । यथाऽरिष्टं सुरा सीधुरासवाद्यमनेकधा ।। (भा.प्र. सन्धानवर्ग)

Drugs possessing *tamoguṇa* predominantly and cause derangment of the mind are called *madakārī*; for exasmple *sūra* and other *madhyakalpanās* (alcoholic beverages).

बुद्धिं लुम्पति यद् द्रव्यं मदकारिं तदुच्यते । तमोगुणप्रधानं च यथा मद्यं सुरादिकम् ।। (शा.प्र.ख. ४/२२)

केवलं द्रवद्रव्यं वा भेषजान्नादिसंयुतम् । चिरकालस्थितं वैद्यैः सन्धानं परिकीर्तितम् ।।

तस्य भेदद्वयं प्रोक्तं मद्यं शुक्तं तथैव च ।। (द्र.गु.वि. यादवजी)

हर्षणं प्रीणनं मद्यं भयशोकश्रमापहम् । प्रागल्भ्यवीर्यप्रतिभातुष्टिपुष्टिबलप्रदम् ।।

सात्विकै विधिवद् युक्त्या पीतं स्यादमृतं यथा ।। (च.सू. २७/१९५)

Madhya in general is exhilerating, and nourishing. It elimnates fear, grief and exhaustion. It promotes confidence, energy, intelligence, contentmet, nourishment and strength. If taken by good people observing all the rules, it works as an elixir.

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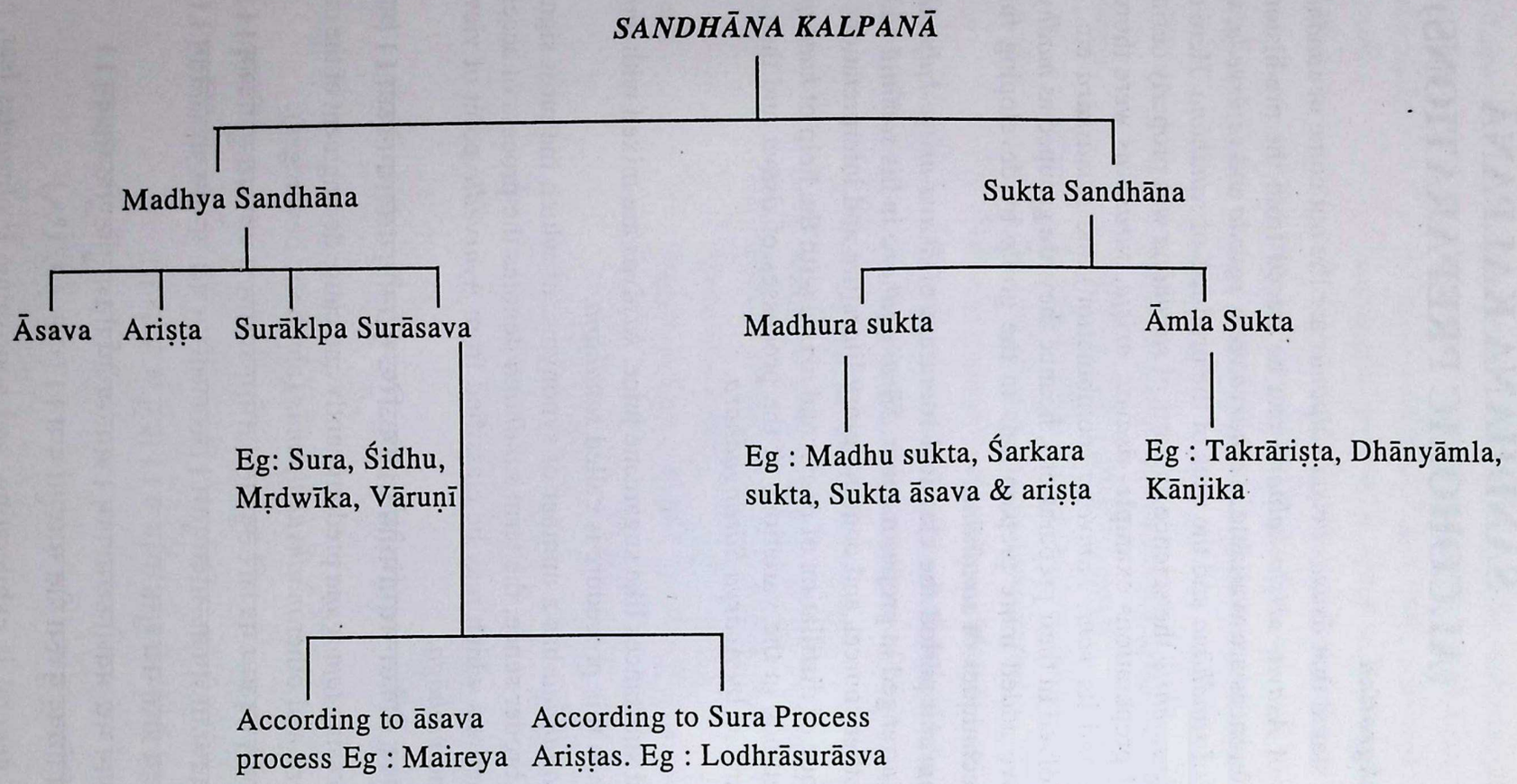
CLASSIFICATION OF SANDHĀNA KALPANĀ

Sandhāna has been classified into two main heads viz., *Madhya Sandhāna* and *Sukta Sandhāna.*



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Āsava and Ariṣṭa Kalpanā

Āsava and *ariṣṭas* are alcoholic preparations. From *saṁhitā* period onwards these preparations are in the usage of therapeutic practice.

Āsavāriṣṭa preparations have accupied unique place amongst all the *madhya kalpanās* and all the other *kalpanās* mentioned in *Āyurveda*. These preparations are more popular and appreciated because of their quick action, high preserving qualities. Usually herbal remedies loose their potency after some time period, hence ancient *Āyurvedic* scholars has mentioned these *kalpanās*, by which active principles of the medicinal drugs will be preserved for prolong period in alcoholic media. These preparations made by soaking the drugs, either in powder form or in the form of *kaṣāya*, in a solution of sugar or jaggery, as the case may be, for a specified period of time, during which it undergoes a process of formentation. Some amount of sugar which is present in sweetining substances will be reduced and converted in to alcoholic media. Generating alcohol, thus facilitating the dissolution of the active principles, in to the liquid media, contained in the drugs . The alcohol, so generated, also serves as a preservative for the formuleae. These preparations on account of their very long shelf- life, quick absorption property are considered highly effective in therapeutic uses.

द्रवेषु चिरकालस्थं द्रव्यं यत्संधितं भवेत् । आसवारिष्टभेदैस्तु प्रोच्यते भेषजोचितम् ।। (शा.सं.म.ख. १०/१)

Water in which, drugs kept for long periods, getting fermented are known as *āsavas* and *āriṣṭas*. Such of them useful in medical treatment.

यदपक्वौषधाम्बुभ्यां सिद्धं मद्यं स आसवः । अरिष्टः क्वाथसिद्धः स्यात्तयोर्मानं जलोन्मितम् ।।

(शा.सं.म.ख. १०/२)

Āsava is prepared in cold water without boiling the drugs, whereas *ariṣṭa* is prepared by boiling. The medicinal dose of both is the same as that of water taken for early morning drink.

The formulation which is produced by *sandhāna* (formentation) is called *āsava*.

Āriṣṭa is prepared by *kwātha* (agni samyoga is essential for preparing *kwātha* in *ariṣṭa kalpanā*). The dose of both *Āsava* and *ariṣṭa* is one *pala*.

पक्वौषधाम्बुसिद्धं यन्मद्यं तत्स्यादरिष्टकम् । (भा.प्र.)

Scholar *Bhāvamiśra* also mentioned that, *ariṣṭa* should be prepared by preparing *kwātha*. *Scholar yadavaji* in his *dravyaguṇavijñānam* regarding *ariṣṭa* mentioned like this.

न रिष्यते इति अरिष्टः । (शा.सं.मा.ख. १०/१)

Without spoiling, the formulation which can stay for long period that is called *ariṣṭa*.

These definitions are mentioned only to stress their stability period and method of preparation. Sometimes *āsava* also can stay for longe period and *ariṣṭa* also supposed to be prepared by fermentation (*sandhāna*) only.

According to ancient *Ācāryas* (i.e. *Agnivesa, Suśruta* etc.) there is no much difference in *āsava* and *ariṣṭa*. Because in *caraka saṁhitā* some of the *āsavas* are mentioned, which are supposed to be prepared by fermentation of different *kwāthas*. Eg- *Madhyāsava* and in some of the *ariṣṭas* without preparing *kwātha*, directly they are supposed to fermentation and *ariṣṭa kalpanā* is prepared Eg- *Madhvāriṣṭa*. Same manner in *suśrutha saṁhitā* also without preparing *kwātha* some of the *ariṣṭas* are advised to prepare Eg. *Mṛttikāriṣṭa*.

But many of the times commonly *āsava* without *kwātha* and *ariṣṭa* with *kwātha* are prepared.

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Even though *āsava* and *ariṣṭa* are categorised under the group of *madhyakalpanā*, but they are supposed to be used in the form of medicine only.

During the process of fermentation because of chemical changes alcohol, and CO_2 gas etc. are produced. Because of presence of this self generated alcohol, these formulations (*Āsavāriṣṭas*) can stay for prolonged period. Moreover it is mentioned that *purāṇa* (old) *āsavariṣṭas* are more efficacious. Here alcohol works as a natural preservative in the formulation and it protects from spoilage of active Principles from different micro-organisms.

In *ariṣṭa kalpanā*, because by adding the *kwātha*, there may be chance for getting more active principles in to the formulation with comparing to *āsava kalpanā*. Except this difference, rest of the things like, method of fermentation, and there applicability is one and same for both *āsava* and *ariṣṭakalpanās*.

Preparation of āsava and ariṣṭa

Equipments Required

The basic equipments are

1. *Sandhāna pātra* and other necessaries, like

A paddle like stirrer

A cloth ribbon to seal the vessel

A clean cloth of fine and strong texture for filtering

A vessel to keep the liquids or to boil the drugs etc.

Sandhāna pātra

Āsavariṣṭas are advised to prepare in earthen pot, and this earthen pot should be sufficiently large and strong with glazed exterior and the lid of correct size to close it.

The containers, used for fermentation were found to be called by different terminologies in *Āyurveda. Such as Bhāṇḍa, kalaṣa, kumbha, bhājana, pātra* etc. these equipments are usually constructed by mud, metal (*loha, tāmra, swarṇa*), wood, porcelain etc. materials.

Usually at present in pharmacies where these alcoholic medicaments are manufactured, in large quantity, the fermentation is carried out in huge wooden vats (containers) with wooden covers, porcelain jars or metal vessels are used in place of earthen pots, Usually air tight wooden vat will be constructed and used.

These fermenting containers before using should be tested for some time period , for micro holes, cracks, which facilitates leakage of medicine. Then container is cleaned properly and disinfected by applying certain lepas (pastes) and by *dhūpana* (fumigation). This special *saṁskāra* is very essential for proper formentation. *Madhulepana, ghṛtha lepana, lodhra madhu kalka lepana, sudhākalka lepana* etc. *lepanas* are prescribed. Then fumigation is done with *candana, guggulu, marīca, lodhra, jaṭāmāmsi, agaru, guḍa* etc. drugs. If the fermentation is to be carried in an earthen pot, it should not be new. Water should be boiled first in the pot. Absolute cleanliness is required during the process.

Drugs Required

The necessary ingredients for the preparation of *āsava* and *ariṣṭa*. The drugs are divided in to four sections as given below according to their particular need in the process.

1. The main drugs

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2. Drava dravyas
3. Sweetening substances
4. Fermentation initiators and *prakṣepa dravyas.*

The Main drugs

The main drugs from which the extract or *kaṣāya* is taken as the case may be. These are the drugs which are pharmacologically and therapeutically much important in the given medicine and the name of the medicine is derived from these drugs denoting their importance. For preparing *Āsavāriṣṭas,* references of usage of herbal, mineral and animal origin drugs are freely available. Out of the three, though the herbal drugs are abundantly used for these preparations, the other types are also not uncommon. In addition to the usage of roots, fruits, flowers, seeds, barks , leaves, hard woods, resins etc. even the ash (*palāṣa bhasma, tilanāla bhasma*) of certain plants have also been recommended by *Ācarya suśruta.*

In mineral drugs there is mention of *loha cūrṇa*, *swarṇabhasma* in some preparations . In certain preparations, definite quantity of metal is found to be added in the form of *cūrṇa*, *bhasma* or thin leaves etc. As mentioned in *Bhaiṣajyaratnāvali- Rasāyaṇādhikara*, *Saraswatāriṣṭa*, *svarṇa* is said to be added in the form of *svarna bhasma* or *svarṇa, patras. Scholar pakṣadhar jha* the author of *Āsavāriṣṭa vijñāna*, mentions another method of addition of *loha* to *Āsavariṣṭas*. He states that *loha cūrṇa* or even *loha bhasma* if added directly will not dissolved in *āsavariṣṭa*. So to make it dissolved, the *loha cūrṇa* must be kept with *triphala cūrṇa* and water for a week, then to this solution, other *prakṣepa dravyas* are to be added and finally it is to be mixed to the fermenting media.

The basic drugs from which the extract is to be prepared are first cleaned and rinsed in water to get rid of dirt. In the case of fresh plant drugs, they are cleaned and cut in to small pieces and pressed for collection of juice. If the drug is dry and it is to be used in the preparation of *āsava*, it is coarsely crushed and added to the water to which the prescribed quantity of honey, jaggery or sugar are added. If it is an *ariṣṭa*, decoction is obtained by boiling the drugs in the specified volume of water. The water used should be clean, clear and potable.

Drava dravyas

The *drava dravyas* used for preparation of *Āsavāriṣṭas* are *swarasa, kwātha, water, takra, dadhi, gomūtra, kāñji, dhānyāmla* etc. of these, water, *kwātha* and *swarasa* are more commonly used liquids than the others. In some instances two or three liquids are found used together. Regarding the *drava dravya* quantity *Ācārya Śāraṅgdhara* concept is mentioned previously.

Sweetening substances

As a sweetening agent *Guḍa* (jaggery), *śarkara* (sugar), *phāṇita*, *sitopala, matsyandika* and *khaṇḍa sita* (types) of jaggery and sugar) are found used. In addition to these, honey is also used either alone or along with *guḍa or śarkara. Drākṣa* and *madhūka puṣpa* are also found used in some cases as a sweetening agents. In the case of sugar, it should be pure white cane sugar. The jaggery should be of sweet taste and at least an year old. The honey should be genuine and preferably old one.

As regards the proportion of water, sweetening agents and medicinal drug powders *Ācārya Śāraṅgadhara* concept is as fallowes.

अनुक्तमानारिष्टेषु द्रवद्रोणे तुलां गुडम् । क्षौद्रं क्षिपेद्गुडादर्धं प्रक्षेपं दशमांशिकम् ।। (शा.सं.म.ख. १०/३)

Where not specified, the quantity of water to be taken for the preparation of *ariṣṭa* is one *droṇa*,

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that of jagggery (*guḍa*) is one *tulā* (hundred *palas*), honey half the measure of jaggery and powder of drugs (*prakṣepa dravya*) one tenth.

The minimum percentage of sweetening substances recommended is 20% while maximum percentage is up to 40% , which have been mentioned in *caraka* and *suśruta*, respectively.

Fermentation initiators and praksepa dravyas

These are the drugs which provides the inoculum for the fermentation to start. The process of fermentation necessitates the presence of fermenting micro-organisms known as yeasts. The *dhātaki puṣpa* is considered as one of the *prakṣepa dravyas*, introduced first time by *Vāghbhaṭṭa*. The dried flowers of *dhātaki* (wood fordia fruticosa, linn.) are used in the preparation of many *ariṣṭas* and *āsavas* for stimulating fermentation, process.

Dhātaki flowers are nectariferous and higly tanniniferous. The flowers of the *dhātaki* serve the purpose of fermentation. The presence of tannin in these flowers produces a conducive environment for yeast growth when *dhātaki puṣpa* are not used in some preparations, the inoculum of yeasts either from *madhūka puṣpa*, the honey or resins are suffice for initiating the process of fermentation. The yeasts multiply rapidly in number by division in a short time.

Ācārya Śāraṅgadhara has mentioned the quantity of *prakṣepa dravyās* 1/10th quantity of *guḍa* (jaggery) as mentioned Previously. The *prakṣepa dravyas* besides contributing to the fermentation and flavour of the medicine, have their pharmacological actions too.

Dhātaki Puṣpa (flowers of woodfordia fruiticosa)

Tāmrapuṣpi and *Agnijwāla* are attributable as synonyms to *dhātaki puṣpa* as the colour of *dhātaki* is red, like fire, the flowers appears in clusters so it is also called by *Guccha puṣpi*. As the plant grows in hilly regions it is called by *parvati* (*parvati* from *parvata*- mountain). Wood fordia fruticosa, is a large erect or some what straggling often deciduous much branched, reaches about 3.5 meters in height . The plant produces numerous small elongated short pedicelled bright reddish or scarlet flowers 2- 2.5 cms long.

Dhātaki flowers contain large quantity about 20% of tannic acid.

Prayojyānga- puṣpa

Pharmacological actions

Rasa	:	*Kaṣāya, kaṭu*
Guṇa	:	*Laghu, rūkṣa*
Vipāka	:	*Kaṭu*
Upayoga	:	*Tṛṣna, atisāra, visarpa, garbhastāpaṇi, raktaja kṛmi, raktatisāra and vraṇa.*

Madhūka puṣpa (flowers of madhūka indica J.F. Gmel)

It is a large deciduous tree of 40- 50 feet height. The flowers are in the clusters of yellowish, white fleshy. The tree is valued for its flowers, its fruits, its seeds of considerable economic importance. The flowers will be in dense fascicles near the end of the branch below the terminal bud, pedicle 2.5 – 3.8 cms long.

Constituents of the flowers

Contains sugar, cellulose, albuminous substances ,ash, water etc. Dried flowers contain from, 50- 60% sugar. A spirit is distilled from the flowers. Flowers contain a fairly good quality of sugar, enzymes and yeast.

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Pharmacological Properties

Rasa	:	*Madhura, kaṣāya*
Guṇa	:	*Guru, snigdha*
Vipāka	:	*Madhura*
Vīrya	:	*Śīta, Dry flowers are of uṣṇa vīrya.*
Upayoga	:	*Śwāsa, kāsa, rājayakṣma, tṛṣna, dāha raktapitta, grahaṇi.*
Prayojyānga	:	*flower*

Process of Āsavāriṣṭa Preparation

If the drug is dry and is to be used in the preparation of *āsava*, the coarse powder of all the ingredients are to be soaked in sufficient quantity of water for over night. Next day it has to be transferred to the *sandhāna pātra*, to this specified quantity of boiled and cooled water, honey, jaggery or sugar etc. or added as directed in the recipe and completely dissolved. If it is an *ariṣṭa,* decoction is obtained by boiling the drugs in the specified volume of water. The water should be clean, clear and potable. The *kaṣāya* is to be transferred to the *sandhāna pātra* and other substances (sugar, jaggery and honey etc.) are added as directed in the recipe and completely dissolved. The *prakṣepa dravyas* are coarsely powdered and added to the sweetened extract. Too fine a powder of the *prakṣepa dravyas* is undesirable as it causes sedimentation in the prepared medicine and its filtration is difficult. In the *sandhāna pātra* all the contents are filled up to 3/4th of its capacity. This unfilled space provides room for the fermenting liquid when it rises up frothing and evolving a large amount of gases. Otherwise the medium may damage the container and flow out.

Usually dhātaki puṣpa, madhūka puṣpa, honey are suffice for initiating the process of fermentation. Because of the inoculum the fermentation is initiated. The yeasts multiply rapidly in number by division in a short time.

Finally *sandhāna pātra* is closed and sealed. The mouth of the *sandhāna pātra* is covered with lid and sealed with mudsmeared cloth for seven times. Sealing is done by winding around a ribbon of cloth smeared with clay on one surface. When sealing the blank surface, the ribbon should line the rim of the vessel (*sandhāna pātra*) and lid and the clay side should be external. After sealing the *sandhāna pātra* is placed in a suitable dark place without much circulation of air. Soft packing of straw should be provided around the *sandhāna pātra* to prevent breakage by any force. The *sandhāna pātra* is left undisturbed for a specific period for proper fermentation.

Place, season and duration of fermentation

Variation in temperature effects the fermentation process. Hence ancient *Ācāryas* have mentioned that, to mentain the uniformity of temperature throught the fermentation process the containers were said to be kept inside the heap of paddy, barley, husk, dry grass or inside the ground etc. Now a days some of the pharmacies are using air conditioned rooms where temperature could be controlled to a desired range. The principle being that there should not be much wind are light which would delay or other wise effect the process of fermentation.

The time required for completion of fermentation is said to vary from season to season, as well as from preparation to preparation. According to ancient classics minimum time limit is of *seven days* and maximum is *sixmonths*. In different classics, different opinions are found mentioned on this point viz., in *caraka saṁhitā*, the minimum time limit is 7 days and is fallowed by *suśruta saṁhitā* and *Aṣṭāṅgasaṅgraha*, but in *Aṣṭāṅgahṛdaya* it is of 15 days.

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As regards the maximum time limit, *Ācārya Caraka* mentioned it as *1½ months, Suśruta 4 months, Aṣṭāṅgasaṅgraha 6 months* and *Aṣṭāṅgahṛdaya* 1 month.

In usual practice, 7 to 10 days are enough in the hot tropical climate and the long period of 30 days is allowed in cool temperate climate where biological activity is at its low.

Further, there are some preparations where iron is added , in such cases the maximum time limit advised is, till the metal dissolve completely in the solution. The term used for this is, *aloha samkṣayat*, which means till the whole metal is lost or dissolved in to the solution.

Filtration

After proper fermentation the liquid form of medicine is filtered and kept for a few days to allow the sediments to settle down in the bottom and again filtered to separate the sediment. The sediment is thrown out and after a day or two, the obtained *āsava or ariṣṭa* is bottled. In pharmacies the filtrations is carried out by electric filter presses with filter sheets which efficiently separate the suspended particles and isolate clear medicine.

Observations of asavarista are to be done in different stages of fermentation

1. At the initial stage of fermentation
2. After the onset of fermentation
3. After the completion of fermentation process

Observations at the initial stage (while keeping the fermenting media for fermentation).

1. In the beginning, the *prakṣepaka dravyas* (*dhātaki puṣpa* etc.) will be floating on the surface of the fermenting media (liquid).
2. It will be thicker than water consistency.
3. The temperature of room, husk where the *sandhāna pātra* is kept should be around 34 ^{0}C.
4. The temperature of the fermenting media also will be around 34 ^{0}C.

Observations, after the onset of fermentation

1. At this stage, the *prakṣepa dravyas* will be floating.
2. The colour of the fermenting media will changes.
3. Mild alcoholic odour will appears on close and constant observation.
4. Effervesence will be visible.
5. A typical sound can be heard, close to the *sandhāna pātra.*
6. Burning candle was found extinguished if taken inside the container.

(In the absence of modern technological aids, simple guidelines are given to be followed during the manufacturing process. For example, "a candle held over a cask containing incompletely processed *āsava* would be extinguished (due to generation of carbon dioxide) as the fermentation process continues, while the tank of *āsava* ready for use will let the candle burn and will be as clear as water to show mirror like reflection of ones face.)

Lime water test: for this purpose one rubber tube is connected from *sandhāna pātra* to test tube, which is filled with lime water. This manover fascilitates transmission of gas produced in *sandhāna pātra* to test tube. During this test air bubbles will be seen in lime water and lime water turns in to milky, due to release of CO_2 during fermentation (when the fermentation starts, glucose oxidises to

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alcohol and CO_2 due to the enzymatic actions of yeast cells present in the fermenting media. The CO_2 thus released produces air bubbles and turns lime water to milky by chemical reaction. Calcium hydroxide [$Ca(OH)_2$] combines with CO_2 and produces white coloured calcium carbonate precipitate [$Ca(OH)_2 + CO_2 = CaCo_3 + H_2O$].

The temperature of fermenting liquid will be found slightly raised. It may reach nearer about 36°C to 38°C.

Observations after completion of fermentation process:

1. The *prakṣepaka dravyas* will sunk completely.
2. The fermented material will posses alcoholic odour.
3. No sound heard and no effervesence is present.
4. The temperature of prepared *āsava* or *ariṣṭa* is found to be reduced to nearer about 32°C.
5. The burning candle continued to burn, if brought near the fermenting media.
6. No change can be found in the lime water test.
7. Completion of fermentation process also can be elicited by doing organoleptic examination (under the heading organoleptic tests, the colour, odour, taste and consistency of the samples were examined) and other tests.

By doing above mentioned all tests it can be conformed that, fermentation process is completed.

In addition to the above mentioned all tests, several parameters relevant to the quality control (tests for standerdisation) of āsava and *ariṣṭa* are mentioned here under.

Physico-Chemical tests

1. Specific gravity,
2. PH value.
3. Total acids in terms of acetic acid.
4. Solid content,
5. Ash content.
6. Acid- insoluble ash content.
7. Alcohol content.
8. Reducing sugar content.
9. Total sugar content.
10. Non-reducing sugar content.
11. Alkaloid content
12. Thin layer chromatographical (T.L.C.) study to characterise the major alkaloids.

Phyto-chemical tests

Different chemical tests were carried out for the detection of the presence of the following groups of phyto-chemicals;

1. Sterols.
2. Triterpenoids
3. Flavanoids
4. Proteins
5. Alkaloids
6. Tannins

Only supernatent portions of the samples were taken for all analytical tests in order to obtain consistent results.

Characteristics

The prepared *āsava* or *ariṣṭa* should be clear without froth at the top and it should be alcoholic up to 12 percent by volume and mostly sweetish in taste with slight acidity and agreeable aromatic alcoholic odour. It should not become more sour (*cukra*).

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Newly prepared *madhya* is *guru* and *vāta vṛddhikaram*, where as *madhya* which is old (after one year) will posses *laghu guṇa, srotośodhanam, dīpanam, and rucivardhaka.*

Estimation of sugar in *āsava* and *ariṣṭa* play an important role in standardisation. According to general principle, initially hundred parts of *āsavas* contain 40 parts of sugars, 20 parts of honey and 10 parts of flavouring substances on completion of process 4-12% of alcohol, 8.3 to 33.69% of reducing sugar, 4.6 to 20.32% of non-reducing sugar, 1.035 to 1.15 % ash contents (Ca,Mg, Cl, SO4 ions), 5.9 to 47.8% total solids, 0.078 to 1.53%, acidity (4 to 5 pH value).

Preservation

Āsavas and *ariṣṭas* can be kept indefinitely. The alcohol, so generated, also serves as a preservative. Prepared *āsavāriṣṭa* can be preserved in well –stoppered bottles, jars or small earthen pots and they should be closed tightly by closure, to avoid entry of air in to the container.

Bottles should not be filled completely, some of the empty space has to be left, so that, gas which is produced in that container can occupy that empty space, if at all bottles are filled completely, there may be chance of *Āsavāriṣṭa* to come out from the bottle or breakage of the bottle.

Whatever the time passes, that much potency increases in the āsavariṣṭa, hence it is said that *āsavariṣṭa* are as old as good.

Mātra

Ācārya Śāraṅgadhara has mentioned one *pala* is the dose for both *āsava* and *ariṣṭa kalpanās.*

Time and mode of administration of āsava and ariṣṭa

Usually *āsavariṣṭa* are advised to take after food. But according to the disease, and patient, time of *āsavāriṣṭa* administration can be altered.

While administration of *āsava* or *ariṣṭa* they are advised to take after mixing of equal quantity of water. Because these are alcoholic formulations. So that if they are consumed without dilution of water, may cause damage to the sensitive mucosal layer of mouth, throat and oesophagus, hence *dāha* etc. symptoms will be developed. Hence they should be diluted with water and also water dilution fascilitates rapid disintigration of *āsava and ariṣṭa.*

Other types of Sandhāna Kalpanās

Sīddhu Kalpanā

ज्ञेयः शीतरसः सीधुरपक्वमधुरद्रवैः। सिद्धः पक्वरसः सीधुः संपक्वमधुरद्रवैः।। (शा. सं. उ. ख. १०/४)

Juice of sweet substances fermented without boiling them is known as *śītarasa sīdhu* and if prepared by boiling them, it will be called *pakwarasa sīdhu.*

Sura, Prasanna, Kādambarī, Jagala, Medaka, Bakkasa

परिपक्वान्नसंधानसमुत्पन्नां सुरां जगुः। सुरामण्डः प्रसन्ना स्यात्ततः कादम्बरी घनः।।
तद्घो जगलो ज्ञेयो मेदको जगलाद्घनः। वक्कसो हृतसारः स्यात्सुराबीजं च किण्वकम्।।
(शा. सं. उ. ख. १०/५-६)

The fermented liquor prepared by using cooked rice, barley etc. is sura. The clear supernatant fluid of *surā* is called *prasanna*, slightly thicker than it is *kādambarī*, next thicker to it is *jagala;* still thicker is *medaka*. The residue left over after distillation is called *bakkasa*, *surabīja* or *kiṇwa.*

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Vāruṇi, śukṭa

यत्तालखर्जूररसैः संधिता सा हि वारूणी। कन्दमूलफलादीनि सस्नेहलवणानि च।।
यत्र द्रवेऽभिषूयन्ते तच्छुक्तमभिधीयते। विनष्टमम्लतां यातं मद्यं वा मधुरद्रवम्।।

(शा.सं.उ.ख. १०/७)

The liquor prepared with juice of *tāla, kharjūra* is called *vāruṇi*; that prepared with roots, tubers, fruits and added with *sneha* and salts is called as *śukta.*

Chukra

विनष्टः संधितो यस्तु तच्चुक्रमभिधीयते। (शा.सं.उ.ख. १०/८)

The liquor or syrup which gets spoiled and looses its sweetness but becomes sour is known as *chukra.*

Śukta

गुडाम्बुना सतैलेन कन्दमूलफलैस्तथा।।
संधितं चाम्लतां यातं गुड शुक्तं तदुच्यते। एवमेवेक्षु शुक्तं स्यान्मृद्वीकासंभवं तथा।।

(शा. सं. उ. ख. १०/९-१०)

Water in which jaggery is dissolved, mixed with oil, bits of tubers, roots, fruits and fermented to aquire sour taste is called *guḍa śukta*, that of grapes is *mṛdwika śuktā.*

Kānjika, Saṇḍāki

तुषाम्बु संधितं ज्ञेयमामैर्विदलितैर्यवैः। यवैस्तु निस्तुषैः पक्वैः सौवीरं संधितं भवेत्।।

(शा. सं. उ. ख. १०/११)

कुल्माषधान्यमण्डादि संधितं काञ्जिकं विदुः। सण्डकी संधिता ज्ञेया मूलकैः सार्षपादिभिः।।

(शा. सं. उ. ख. १०/१२)

Liquor prepared with *māṇda* of half boiled *kulmāṣa, dhānya* is *kānjika*; that prepared with *mūlaka, sarṣapa*, etc. being added to it becomes *saṇḍāki.*

Sura type of wine is the one where the *māṇda* is not taken out, the sum portion of *sura* type of wine is known is *madirā. Sura* type of wine is prepared by fermenting starchy food articles. Wine prepared of sugar is called *śārkara, Pakvarasa* is prepared by boiling sugar cane juice and *Sitarasasīdhu* by unboiled sugarcane juice. When alchohol is used as liquid for the preparation of a wine it is known as *surāsava. Madhvāsava* is prepared out of the flowers of *madhūka.* When *āsava* and *sura* are mixed together in a vassel and fermented, the wine so prepared known as *maireya. Madhūlikā* type of wine is also known as *medaka.*

Modern aspect of alcoholic formulations

Alcohol is considered as a good solvent. Which comes next in important to water. It has an advantage over water, that preparations made with it remain stable for quite a long time because of its antimicrobial properties. While many aqueous solutions of organic substances soon hydrolysed and can be mixed in any preparation, such mixing of water and alcohol are referred to as hydroalcoholic solvents . Which are extensively used in pharmaceutical formulations.

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In modern pharmaceutics similar to our *sandhāna kalpanā* preparations tinctures were mentioned.

Tincture

Tinctures are alcoholic solutions containing all the active ingredients of the drug by which they are compounded. In this respect they differ from the official spirits which are merely alcoholic solutions of essential oils.

They are prepared either by:

1. Maceration, 2. Percolation, 3. Simple solution

Tinctures are 34 in number, of these only one is from Animal kingdom i.e. tincture cocci.

Alcohols of various strength is used to make tinctures, such as alcohol (90%), alcohol (60%) and alcohol (45%). One tincture is made with other substance i.e. tincture lobelia and etherea.

Some tinctures which were formerly grouped under tinctures are know known as liquors.

Tincture Belladonae and Tincture cinchonae etc. were standerdised by chemical assay and biological assay too.

Arjunāriṣṭa (Pārthyāriṣṭa)

पार्थत्वचं तुलमेकां मृद्धीकाऽर्द्धतुलां तथा। भागं मधूकपुष्पस्य पलविंशतिसंमितम्।।
चतुर्द्रोणेऽम्भसः पक्त्वा द्रोणमेवावशेषयेत्। धातक्या विंशतिपलं गुडस्य च तुलां क्षिपेत्।।
मासमांत्रा स्थितो भाण्डे भवेत्पार्थाद्यरिष्टकः। हृत्फुफ्फुसगदान् सर्वान् हन्त्ययं बलवीर्यकृत्।।

(भै. र. हृद्रोगाधिकार)

Ingredients

1. Arjuna	-	*5 kg*
2. Drākṣā	-	*2.5kg*
3. Madhūkapuṣpa	-	*1kg*
4. Dhātaki	-	*1kg*
5. Guḍ	-	*5kg*
6. Water for preparing kwāth	-	*50 lit reduced to 1/4th =12.5lit*

Dose : 10-30ml

Anupāna : Water

Therapeutic Uses

Hṛdayaroga, Respiratory Diseases, Blood Puerifier.

Abhayariṣṭa

अभयायास्तुलामेकां मृद्वीकार्द्धतुलां तथा। विडंगस्य दशपलं मधूककुसूमस्य च।।
चतुर्द्रोणे जले पक्त्वा द्रोणमेवावशेषयेत्। शीतीभूते रसे तस्मिन् पूते गुडतुलां क्षिपेत्।।
श्वदंष्ट्रा त्रिवृतां धान्य धातकीमिन्द्रवारूणीम्।। चव्यं मधुरिकां शुण्ठीं दन्ती मोचरस तथा।।
पलयुग्ममित सर्व पात्रे महाति मृन्मये ।। (भैषज्यरत्नावली, अर्शोरोगाधिकार, १०५-१०७)

Ingredients

1. Haritaki *3.84kg*

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2. Mṛdwīka	-	*1.92kg*
3. Viḍanga	-	*0.384kg*
4. Madhūkpuṣpa	-	*0.384kg*
5. Water	-	*39.32 lit. reduced to 9.83 lit.*
6. Guḍ	-	*3.84kg*
7. Gokṣūr	-	*76.8gm*
8. Trivṛt	-	*76.8gm*
9. Dhānyak	-	*76.8gm*
10. Dhātaki	-	*76.8gm*
11. Indravāruṇi	-	*76.8gm*
12. Cavya	-	*76.8gm*
13. Madhurika	-	*76.8gm*
14. Śuṇṭhi	-	*76.8gm*
15. Danti	-	*76.8gm*
16. Mocaras	-	*76.8gm*

Dose : 12-24 ml

Anupāna : Water

Therapeutic Uses

Agnimāndhya, Vibhanda, Arśa.

Arvindāsava

अरविन्दमुशीरन्च काश्मरीं नीलमुत्पलम् । मंजिष्ठैला बलामांसोरम्बुदं शारिवां शिवाम् ।।
विभीतकवचाधात्रीः शटीं श्यामां सनीलिनीम् । पटोलं पर्पटं पार्थं मधूकं मधुकं मुराम् ।।
पलमानेन संग्रृहय द्राक्षायाः पलविंशतिम् । धातकी षोडशपलां जलद्रोणद्र्वये क्षिपेत् ।।
शर्करायास्तुलां तत्रा तुला द्र्ध आक्षिकस्य च । मासं संस्थापयेद् भाण्डे मृत्तिका परिनिर्मिते ।।

(भै. र. बालरोगाधिकार; १८५-१८६)

Ingredients

1. Aravinda	-	*96gm*
2. Uśira	-	*96gm*
3. Kāśmari	-	*96gm*
4. Manjiṣṭha	-	*96gm*
5. Nilotpala	-	*96gm*
6. Manjiṣṭha	-	*96gm*
7. Ela	-	*96gm*
8. Bala	-	*96gm*
9. Māmsi	-	*96gm*
10. Ambuda	-	*96gm*
11. Śāriva	-	*96gm*

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12. Haritaki	-	*96gm*
13. Bibhitaki	-	*96gm*
14. Vaca	-	*96gm*
15. Āmalaki	-	*96gm*
16. Śaṭhi	-	*96gm*
17. Śyāma	-	*96gm*
18. Nilini	-	*96gm*
19. Paṭola	-	*96gm*
20. Parpaṭa	-	*96gm*
21. Arjuna	-	*96gm*
22. Madhūka	-	*96gm*
23. Yaṣṭimadhu	-	*96gm*
24. Mura	-	*96gm*
25. Drākṣa	-	*1.920kg*
26. Dhātaki	-	*1.536kg*
27. Water	-	*5.152lit*
28. Śarkara	-	*9.6kg*
29. Madhu	-	*4.8kg*

Dose : 3-12 ml.

Anupāna : Water.

Therapeutic uses

Agnimāndya, Kārśya, Balakṣaya.

Amṛtāriṣṭa

अमृतायाः पलशतं दशमूल्यास्तथैव च। पादावशिष्टं पक्त्वा च चतुर्द्रोणे जले भिषक् ।।
गुडस्य त्रितुलाः सिद्धे क्वाथे शाते क्षिपेत्पुनः। अजाज्याः शोडषपलं द्विपलं रक्तपुष्पकम् ।।
सप्तच्छद तथा व्योषं नागकेशरमब्दकम्। कट्वोप्रतिविषे वत्सबीजन्च पलसम्मित्तम् ।।

(भै. र. ज्वराधिकार; ६९०-६९२)

Ingredients

1. Amṛta	-	*384gm*
2. Bilwa	-	*384gm*
3. Śyoṇāka	-	*384gm*
4. Gambhāri	-	*384gm*
5. Pāṭala	-	*384gm*
6. Agnimantha	-	*384gm*
7. Śālaparṇi	-	*384gm*
8. Pṛṣṇiparṇi	-	*384gm*
9. Bṛhati	-	*384gm*

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10. Kaṇṭakāri - 384gm
11. Gokṣūra - 384gm
12. Water for kwātha reduced to 9. 830lit
13. Ajāji - 624gm
14. Guḍa - 11.52kg
15. Raktapuṣpaka - 76.8gm
16. Saptacchada - 38 gm
17. Śuṇṭhi - 38gm
18. Marica - 38gm
19. Pippali - 38gm
20. Nāgakeśara - 38gm
21. Muṣṭa - 38gm
22. Kaṭuki - 38gm
23. Ativiṣa - 38gm
24. Indrayava - 38gm

Dose : 12 – 24 ml.

Anupāna : Water.

Therapeutic uses

Jwara, Viṣamajwara.

Aśokariṣṭa

अशोकस्य तुलामेकान्चतुर्द्रोण जले पचेत्। पादशेषे रसे पूते शीते पलशतद्वयम्।।
दद्यात् गुडस्य धातक्याः पलषोडशिकं मतम्। अजाजी मुस्तकं शुण्ठीं दार्व्युस्पलफलत्रिकम्।।
आम्रस्थि जीरकं वासां चन्दनन्च विनिक्षिपेत्। चूर्णयित्वा पलाशेन ततो भण्डे निधापयेत्।।

(भै. र., स्त्रीरोगाधिकार; ११४-११६)

Ingredients

1. Aśoka - 4.8kg
2. Water for kwātha - 49.152lit
reduced to - 12.288 lit
3. Guḍa - 9.6 kg
4. Dhātaki - 768 gm
5. Ajāji - 48gm
6. Mustaka - 48 gm
7. Śuṇṭhi - 48 gm
8. Dārvi - 48 gm
9. Utpala - 48 gm
10. Haritaki - 48 gm
11. Bibhitaki - 48 gm

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12. Āmalaki	-	*48 gm*
13. Amrasthi	-	*48 gm*
14. Jīraka	-	*48 gm*
15. Vāsa	-	*48 gm*
16. Candana	-	*48 gm*

Dose : 12 - 24 ml.

Anupāna : Water.

Therapeutic uses

Aśṛgdara, Yoniroga, Śvetapradara.

Aśwagandhādyariṣṭa

तुलादर्धं चाश्वगन्धाया मुसल्याः पलविंशति । मंजिष्ठाया हरीतक्या रजन्योर्मधुकस्य च ।।
रास्ना विदारी पार्थानां मुस्तक त्रिवृतोरपि । भागान दशपलान् दद्यादनन्ताश्यामयोस्तथा ।।
चन्दनदिवतयस्यापि वचायाश्चित्रकस्य च । भागानष्टपलान् क्षुण्णामष्टद्रोणेंऽभ्मसः पचेत् ।।
द्रोणेशेषे कषायेऽस्मिन् पूते शीते प्रदापयेत् । धातक्याः षोडशपलं माक्षिकस्य तुलात्रयम् ।।
ब्योषे तु दिवपलं त्रिजातकचतुःपलम् । चतुः पलं प्रियंगोश्च द्विपलं नागकेशरम् ।।

(भै. र., मूर्च्छाधिकार; १३-१७)

Ingredients

1. Aśwgandha	-	*4.8kg*
2. Musali	-	*1.92kg*
3. Manjiṣṭha	-	*0.96kg*
4. Haritaki	-	*0.96kg*
5. Haridra	-	*0.96kg*
6. Dāruharidra	-	*0.96kg*
7. Yaṣṭimadhu	-	*0.96kg*
8. Rāsna	-	*0.96kg*
9. Vidāri	-	*0.96kg*
10. Arjuna	-	*0.96kg*
11. Mustaka	-	*0.96kg*
12. Trivṛt	-	*0.96kg*
13. Śāriva	-	*0.78kg*
14. Kṛṣṇa śāriva	-	*0.78kg*
15. Śwetacandana	-	*0.78kg*
16. Raktacandana	-	*0.78kg*
17. Vaca	-	*0.78kg*
18. Citraka	-	*0.78kg*
19. Water for kwātha	-	*98.330 lit. reduced to 24.506 lit.*
20. Madhu	-	*28.800kg*

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21. Dhātaki	-	*1.536kg*
22. Śuṇṭhi	-	*192gm*
23. Marica	-	*192gm*
24. Pippali	-	*192gm*
25. Twak	-	*384gm*
26. Ela	-	*384gm*
27. Patra	-	*384gm*
28. Priyāngu	-	*384gm*
29. Nāgakeśara	-	*192gm*

Dose : 12-24 ml.

Anupāna : Water.

Therapeutic uses

Mūrccha, Apasmāra, Unmāda, Kārsya, Vātaroga.

Candanāsav

चन्दनं बालकं मुस्तं गांभारीं नीलमुत्पलम्। प्रियंगुं पद्मकं लोध्रं मंजिष्ठां रक्तचन्दनम्।।
पाठां किराततिक्तन्च न्यग्रोधं पिप्पलीं शटीम्। पर्पटं मधुकं रास्नां पटोलं कान्चनारकम्।।
आम्रत्वचं मोचरसं प्रत्येक पलमात्रकम्। धातकीं षोडशपलां द्राक्षायाः पलविंशतिम्।।
जलद्रोणिद्वये क्षिप्त्वा शर्करायास्तुलां तथा। गुडस्याद्र्धतुलान्चापि मासं भाण्डे निधापयेत्।।

(भै. र. शुक्रमेहाधिकार; ३४-३७, १/२)

Ingredients

1. Śwetacandana	-	*19.2gm*
2. Bālaka	-	*19.2gm*
3. Muṣṭa	-	*19.2gm*
4. Gambhāri	-	*19.2gm*
5. Nilotpāla	-	*19.2gm*
6. Priyāngu	-	*19.2gm*
7. Padmaka	-	*19.2gm*
8. Lodhra	-	*19.2gm*
9. Manjiṣṭha	-	*19.2gm*
10. Rakta candana	-	*19.2gm*
11. Pāṭha	-	*19.2gm*
12. Kirātatikta	-	*19.2gm*
13. Nyagrodha	-	*19.2gm*
14. Pippali	-	*19.2gm*
15. Śaṭi	-	*19.2gm*
16. Parpaṭa	-	*19.2gm*
17. Madhūka	-	*19.2gm*

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18. Rāsna	-	*19.2gm*
19. Paṭola	-	*19.2gm*
20. Kāñcanāra	-	*19.2gm*
21. Amratvak	-	*19.2gm*
22. Mocarasa	-	*19.2gm*
23. Dhātaki	-	*307 gm*
24. Drākṣā	-	*384 gm*
25. Water	-	*10 lit*
26. Śarkara	-	*1.92 kg*
27. Guḍa	-	*960 gm*

Dose : 12 to 24 ml.

Anupāna : Water.

Therapeutic uses

Mūtrakṛcchra, Śukrameha, Hṛdroga.

Daśamūlariṣṭa

पर्ण्यौ बृहत्यौ गोकण्टो बिल्वोऽग्निमन्थकोऽरलुः।। पाटला काश्मरी चेति दशमूलमिहोच्यते।
दशमूलानि कुर्वीत भागैः पञ्चपलैः पृथक्।। पञ्चविशत्पलं कुर्याच्चित्रकं पौष्करं तथा।
कुर्याद्विंशत्पलं लोध्रं गुडूची तत्समा भवेत्।। पलैः षोडशभिर्धात्री रविसंख्यैर्दुरालभा।
खदिरो बीजसारश्च पथ्या चेति पृथक्पलैः।। अष्टभिर्गणितैः कुष्ठं मञ्जिष्ठा देवदारु च।
विडङ्गं मधुकं भार्ङ्गी कपित्थोऽक्षः पुनर्नवा।। चव्यं मांसी प्रियङ्गुश्च सारिवा कृष्णजीरकम्।
त्रिवृता रेणुकं रास्ना पिप्पली क्रमुकः शठी।। हरिद्रा शतपुष्पा च पद्मकं नागकेशरम्।
मुस्तमिन्द्रयवः शुण्ठी जीवकर्षभकौ तथा। मेदा चान्या महामेदा काकोल्यौ ऋद्धिवृद्धिके।
कुर्यात्पृथग्विपलिकान्पचेदष्टगुणे जले।। चतुर्थांशश्रृतं नीत्वा मृद्भाण्डे संनिधापयेत्।
ततः षष्टिपलां द्राक्षां पचेन्नीरे चतुर्गुणे।। त्रिपादशेषं शीतं च पूर्वक्वाथे श्रृतं क्षिपेत्।
द्वात्रिंशत्पलिकं क्षौद्रं दद्याद्गुडचतुःशतम्।। त्रिंशत्पलानि धातक्याः कङ्कोलं जलचन्दनम्।
जातीफलं लवङ्गं च त्वगेलापत्रकेशरम्।। पिप्पली चेति संचूर्ण्य भागैर्द्विपलिकैः पृथक्।
शाणमात्रां च कस्तूरीं सर्वमेकत्र निक्षिपेत्।। भूमौ निखातयेद्भाण्डं ततो जातरसं पिबेत्।
कतकस्य फलं क्षिप्त्वा रसं निर्मलतां नयेत्।। ग्रहणीमरूचिं श्वासं कासं गुल्मं भगन्दरम्।
वातव्याधिं क्षयं छर्दिं पाण्डुरोगं च कामलाम्।। कुष्ठान्यर्शांसि मेहांश्च मन्दाग्निमुदराणि च।
शर्करामश्मरीं मूत्रकृच्छ्रं धातुक्षयं जयेत्।। कृशानां पुष्टिजननो वन्ध्यानां गर्भदः परः।
अरिष्टो दशमूलाख्यस्तेजःशुक्रबलप्रदः।। (शा. सं. म. ख. १०/८७-९२)

Apparatus required

Sandhāna pātra, khalva yantra, cloth.

Drugs required

Kwātha dravya :

1. Parni dwayam : *10 palas*

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2. *Bṛhati dwayam*	:	10 palas
3. *Gokaṇṭa*	:	5 palas
4. *Bilwa*	:	5 palas
5. *Agnimantha*	:	5 palas
6. *Aralu*	:	5 palas
7. *Pāṭalā*	:	5 palas
8. *Kāṣmari*	:	5 palas
9. *Citraka*	:	25 palas
10. *Puṣkara*	:	25 palas
11. *Lodhra*	:	20 palas
12. *Guḍūcī*	:	20 palas
13. *Dhātrī*	:	16 palas
14. *Durālabhā*	:	12 palas
15. *Khadira*	:	8 palas
16. *Bījasāra*	:	8 palas
17. *Pathya*	:	8 palas
18. *Kuṣṭa*	:	8 palas
19. *Mañjiṣṭha*	:	2 palas
20. *Devadāru*	:	2 palas
21. *Viḍaṅga*	:	2 palas
22. *Madhūka*	:	2 palas
23. *Bhārṅgī*	:	2 palas
24. *Kapittha*	:	2 palas
25. *Akṣa*	:	2 palas
26. *Punarnavā*	:	2 palas
27. *Cavya*	:	2 palas
28. *Māṁsī*	:	2 palas
29. *Priyaṅgu*	:	2 palas
30. *Sārivā*	:	2 palas
31. *Kṛṣṇajīraka*	:	2 palas
32. *Trivṛt*	:	2 palas
33. *Reṇuka*	:	2 palas
34. *Rāsnā*	:	2 palas
35. *Pippalī*	:	2 palas
36. *Kramuka*	:	2 palas
37. *Shaṭhi*	:	2 palas
38. *Haridra*	:	2 palas
39. *Satapuṣpa*	:	2 palas
40. *Padmaka*	:	2 palas

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41. Nāgakeśara	:	*2 palas*
42. Mustā	:	*2 palas*
43. Indrayava	:	*2 palas*
44. Śuṇṭhī	:	*2 palas*
45. Jivaka	:	*2 palas*
46. Rsabhaka	:	*2 palas*
47. Meda	:	*2 palas*
48. Mahāmeda	:	*2 palas*
49. Kākolidvayam	:	*2 palas*
50. Ṛddhi	:	*2 palas*
51. Vṛddhi	:	*2 palas*
52. Water	:	*8 parts*

(All above mentioned drugs to be taken as one part, in the form of *yava kūṭa cūrṇa* and mixed with 8 times of water and *kwātha* should be prepared.)

53. Drākṣa	:	*60 palas*
54. Water	:	*4 times (240 palas)*
55. Dhātaki puṣpa	:	*32 palas*
56. Kaṅkola sūkṣma cūrṇa	:	*2 palas*
57. Jala	:	*2 palas*
58. Candana sūkṣma cūrṇa	:	*2 palas*
59. Jātīphala sūkṣma cūrṇa	:	*2 palas*
60. Lavanga sūkṣma	:	*2 palas*
61. Twak sūkṣma cūrṇa	:	*2 palas*
62. Ela sūkṣma cūrṇa	:	*2 palas*
63. Patra sūkṣma cūrṇa	:	*2 palas*
64. Keśara sūkṣma cūrṇa	:	*2 palas*
65. Pippali sūkṣma cūrṇa	:	*2 palas*
66. Kataka phala	:	*appropriate quantity*
67. Kastūrī	:	*1 śāṇa*

Procedure

Five *palas* each of the *daśamūlas* are taken and twenty five *palas* each of *citraka* and *puṣkara*, twenty *palas* each of *lodhra* and *guḍūci*, sixteen *palas* of *dhātrī*, twelve *palas* of *durālabhā*, eight *palas* each of *khadira*, *bījasāra*, *pathyā* and two *palas* each of no-18 to no-51 are taken in *yavakūṭa cūrṇa* form and boiled with eight times of water and *kwātha* is prepared by reducing the total quantity of contents to quarter. Then sixty *palas* of *drākṣā* are boiled in four times to their quantity of water and total contents are reduced to two - thirds and *kwātha* is prepared. Both the *kwāthas* are mixed together. To the mixtrue are added thirty two *palas* of *dhātaki pauṣpa* and *sūkṣma cūrṇa* of two *palas* each of *kaṅkola, candana, jātiphala, lavanga,* twak, *elā, patra, keśara* and *pippalī* are added and put in a mudpot (*sandhāna pātra*) which is later buried underground for one month. After removal, *kataka*

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phala is added to clear it and filtered through cloth. Then one *śāṇa* of *kastūri* is added to it and properly disolved. This recipe known as *daśamūlāriṣṭa*.

Karma : *Puṣṭijanana,* gives pregnence to the childless and *śukra bala pradam.*

Āmayika prayoga : *Grahaṇi, aruch, śwāsa, kāsa, gulma, bhagandara, vātavyādhi, kṣaya, chardi, pāṇḍuroga, kāmalā, mūtrakṛchra, dhātukṣaya, kṛśa.*

Drākṣāriṣṭa

द्राक्षातुलार्धं द्विद्रोणे जलस्य विपचेत्सुधीः।। पादशेषे कषाये च पूते शीते विनिक्षिपेत्।
गुडस्य द्वितुलां तत्र त्वगेलापत्रकेशरम्।। प्रियङ्गुर्मरिचं कृष्णा विडङ्गचेति चूर्णयेत्।
पृथक्पलोन्मितैर्भागैस्ततो भाण्डे निधापयेत्।। समन्ततो घट्टयित्वा पिबेज्जातरसं ततः।
उरःक्षतं क्षयं हन्ति कासश्वासगलामयान्।। द्राक्षारिष्टाह्वयः प्रोक्तो बलकृन्मलशोधनः।

(शा. सं. म. ख. १०/६९-७३)

Apparatus required

Sandhāna pātra, khalvayantra, kaṣāya pātra, cloth etc.

Durgs required

1. Drākṣā	:	*1/2 tulā*
2. Water	:	*2 droṇas*
3. Guda	:	*2 tulas*
4. Twak cūrṇa	:	*1 pala*
5. Ela cūrṇa	:	*1 pala*
6. Patra cūrṇa	:	*1 pala*
7. Kesara cūrṇa	:	*1 pala*
8. Priyangu cūrṇa	:	*1 pala*
9. Marica cūrṇa	:	*1 pala*
10. Kṛṣṇā cūrṇa	:	*1 pala*
11.Viḍaṅga cūrṇa	:	*1 pala*

Procedure

Half *tulā* of *drākṣā* is grinded and boiled in two *droṇas* of water and contents are reduced to quarter and filtered. After cooling two *tulās* of jaggery is added, and mixed well then powder of one *pala* each of *twak, Elā, patra, keśara, priyāṅgu, marīca, kṛṣṇā* and *viḍaṅga* are added and mixed well. The liquid content is kept in a ghee coated mud pot (*saṅdhānapātra*). After proper formentation contents are filtered and obtained product is called *drākṣāriṣṭa*.

Karma : *Balya, malaśodhana*

Āmayika prayoga

Urakṣata, kṣaya, kāsa, śwāsa, galāmaya.

Some of the authors opinion is that, in this *drakṣāriṣṭa* preparation, *drākṣa kwātha* quantity is comparatively less with comparing to the quantity of *guḍa*, hence they advice instead of reducing the *drākṣa kwātha* to quarter, it can be reduced to half so that quantity of *kwātha* is increased.

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Kumāryāsava

सुपक्वरससंशुद्धं कुमार्याः पत्रमाहरेत्। यत्नेन रसमादाय पात्रे पाषाणमृन्मये।।
द्रोणे गुडतुलां दत्त्वा घृतभाण्डे निधापयेत्। माक्षिकं पक्वलोहं च तस्मिन्नर्धतुलां क्षिपेत्।।
कटुत्रिकं लवङ्गं च चातुर्जातकमेव च। चित्रकं पिप्पलीमूलं विडङ्गं गजपिप्पली।।
चविकं हपुषा धान्यं क्रमुकं कटुरोहिणी। मुस्ता फलत्रिकं रास्ना देवदारु निशाद्वयम्।।
मूर्वा मधुरसा दन्ती मूलं पुष्करसंभवम्। बला चातिबला चैव कपिकच्छूस्त्रिकण्टकम्।।
शतपुष्पा हिङ्गुपत्री आकल्लकमुटिङ्गणम्। पुनर्नवाद्वयं लोध्रं धातुर्माक्षिकमेव च।।
एषां चार्धपलं दत्त्वा धातक्यास्तु पलाष्टकम्। पलं चार्धपलं चैव पलद्वयमुदाहृतम्।।
वपुवर्यः प्रमाणेन बलवर्णाग्निदीपनम्। बृंहणं रोचनं वृष्यं पक्तिशूलनिवारणम्।।
अष्टावुदरजात्रोगान्क्षयमुग्रं च नाशयेत्। विंशतिं मेहजात्रोगानुदावर्तमपस्मृतिम्।।
मूत्रकृच्छ्रमपस्मारं शुक्रदोषं तथाश्मरीम्। क्रिमिजं रक्तपित्तं च नाशयेत्तु न संशयः।।

(शा. सं. म. ख. १०/१८-२७)

Apparatus required

Vessel, cloth, sandhāna pātra, khalvayantra, stone vessel or mudpot.

Drugs required

1. Juice extracted from pulp of kumāri leaves	*: 1 droṇa*
2. Guḍa (jaggery)	*: 1 tula*
3. Madhu(honey)	*: ½ tula*
4. Pakwaloha (lohabhasma)	*: ½ tula*
5. Kaṭutrika cūrṇa	*: ½ tula*
6. Lavanga cūrṇa	*: ½ pala*
7. Caturjātaka cūrṇa	*: ½ pala*
8. Citraka cūrṇa	*: ½ pala*
9. Pippalīmūla cūrṇa	*: ½ pala*
10. Viḍanga cūrṇa	*: ½ pala*
11. Gajapippali cūrṇa	*: ½ pala*
12. Cavikā cūrṇa	*: ½ pala*
13. Hapuṣa cūrṇa	*: ½ pala*
14. Dhānya cūrṇa	*: ½ pala*
15. Kramuka cūrṇa	*: ½ pala*
16. Kaṭurohiṇi cūrṇa	*: ½ pala*
17. Musta cūrṇa	*: ½ pala*
18. Phalatrika cūrṇa	*: ½ pala*
19. Rāsnā cūrṇa	*: ½ pala*
20. Devadāru cūrṇa	*: ½ pala*
21. Niṣādwayam cūrṇa	*: ½ pala*
22. Mūrvā cūrṇa	*: ½ pala*

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23. *Madhurasa cūrṇa* : ½ *pala*
24. *Danti cūrṇa* : ½ *pala*
25. *Puṣkaramūla cūrṇa* : ½ *pala*
26. *Bala cūrṇa* : ½ *pala*
27. *Atibalā cūrṇa* : ½ *pala*
28. *Kapikachu cūrṇa* : ½ *pala*
29. *Trikaṅṭaka cūrṇa* : ½ *pala*
30. *Śatapuṣpa cūrṇa* : ½ *pala*
31. *Hiṅgupatri cūrṇa* : ½ *pala*
32. *Akallaka cūrṇa* : ½ *pala*
33. *Mutingaṇa cūrṇa* : ½ *pala*
34. *Punarnava dwayam cūrṇa* : ½ *pala*
35. *Lodhra cūrṇa* : ½ *pala*
36. *Mākṣika dhātu cūrṇa* : ½ *pala*
37. *Dhātakī puṣpa* : *8 palas*
38. *Ghṛta* : *appropriate quantity*

Procedure

Leaves of *kumāri* are washed well, lightly cooked and juice extracted from its pulp. One *droṇa* of this juice is poured into a stone vessel or mudpot. One *tūla* of *guḍa* (jaggery), half *tulā* each of honey and *loha bhasma* are added and then fine powder of half *pala* each of drugs from no-5 to no-36 and *eight palas* of *dhātaki puṣpa* are mixed and filled in to a pot (*sandhāna pātra*) smeared in side with ghee, its mouth is sealed air tight and kept undisturbed for a month. After proper formentation, contents are filtered and obtained *āsava* is called *kumāryāsava*.

Mātra : *1 pala, 1½ pala and 2 palas* according to age and constitution dose has to be regulated.

Karma : *Balavarnāgnidīpanam, bhṛmhaṇa, rocanan (increases taste), Vṛṣyam.*

Āmayika Proyoga

Relieves pain of indigestion, eight kinds of *udara*, severe *kṣaya*, twenty kinds of *prameha, udāvarta, apasmāra, śukra doṣas, aśmari, kṛmi and rakta pitta.*

Kanakāsav

सड क्षुदय कनकं शाखामूलपत्रा फलैः सह। तत्शचतुष्पलं ग्राहयं वृशमूलत्वचस्तथा।।
मधूकं मागधी व्याघ्री केशरं विश्वभेषजम्। भार्गी तालीशपत्रन्च सन्चूर्ण्येषा द्रवयम्।।
सड् ग्रहय धातकीप्रस्थं द्राक्षायाः पलविंशतिम्। जलद्रोणद्वयं दत्वा शर्करायास्तुलां तथा।।
क्षौद्रस्यादर्धुतुलान्चापि सर्व सम्मिश्रय यत्नतः। भाण्डे निक्षिप्य चात्य निदध्यान्मासमात्राकम्।।

(भै. र., हिक्का वासाधिकार; ९७-१०१)

Ingredients

1. *Kanaka (Dhattūra)* - *384gm*
2. *Vāsa* - *384gm*
3. *Yaṣṭimadhu* - *192gm*

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4. Pippali	-	*192gm*
5. Vyāghri	-	*192gm*
6. Keśara	-	*192gm*
7. Śuṇṭhi	-	*192gm*
8. Bhārangi	-	*192gm*
9. Tālisapatra	-	*192gm*
10. Dhātaki	-	*1.536kg*
11. Drākṣa	-	*1.920kg*
12. Water	-	*49.152lit*
13. Śarkara	-	*9.6kg*
14. Madhu	-	*4.8 kg*

Dose : 12-24 ml.

Anupāna : Water.

Therapeutic Uses

Kāśa, Śwāsa.

Khadirariṣṭa

खदिरस्य तुलाऽर्द्धतुं देवरारू च तत्समम्। बाकुचो द्वादशपला दार्वी स्यात्पलविंशतिः।।
त्रिफला विंशतिपला हयष्टद्रोणेडम्भसः पचेत्। कषाये द्रोणशेषे च पूते शीते विनिक्षिपेत्।।
तुलाद्वयं माक्षिकस्य तुलैका शर्करा मता। धातक्या विंशतिपलं कंकोलं नागकेशरतम्।।
जातीफलं लवंगेलात्वक्पत्राणि पृथक् पृथक्। पलोन्मितानि कृष्णाया दद्यात्पलचतुष्टयम्।।
घृतभाण्डे विनिक्षिप्य मासादूर्ध्वे पिबेत्ततः। (शार्ङ्गधरसंहिता, मध्यमखण्ड, अध्याय - १०, ६०-६३-१/२)

Ingredients

1. Khadira	-	*2.4kg*
2. Devadāru	-	*2.4kg*
3. Bakūci	-	*576gm*
4. Dāruharidra	-	*960gm*
5. Haritaki	-	*960gm*
6. Āmalaki	-	*960gm*
7. Bibhitaki	-	*960gm*
8. Water	-	*100lit reduced to -12.5lit*
9. Madhu	-	*9.6kg*
10. Śarkara	-	*4.8kg*
11. Dhātaki	-	*960gm*
12. Kankola	-	*48gm*
13. Nāgakeśara	-	*48gm*
14. Jātiphala	-	*48gm*
15. Lavanga	-	*48gm*

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16. Ela	-	*48gm*
17. Twak	-	*48gm*
18. Patra	-	*48gm*
19. Pippali	-	*192gm*

Dose : 12 to 24 ml.

Anupāna : Water

Therapeutic Uses

Granthi, Gulma, Kṛmi, Plihodara, Arbuda, Pāṇḍuroga, Mahakuṣṭha.

Kuṭajāriṣṭa

तुलां कुटजमूलस्य मृद्वीकादर्धतुलां तथा। मधूकपुष्पकाश्मर्यो भागान् दशपलोन्मितान्।।
चतुर्द्रोणेऽम्भसः पक्त्वा द्रोणन्चैवाव शेषितम्। धातक्या विंशतिपलं गुडस्य च तुलां क्षिपेत्।।
मासमात्रांस्थितो भाण्डेय कुटजारिष्टसंज्ञितः। (भै. र., अतीसाराधिकार; ९७-९८, १/२)

Ingredients

1. Kuṭajamūla	-	19.2kg
2. Drākṣa	-	9.6kg
3. Madhūka puṣpa	-	1.92kg
4. Kāśmari	-	1.92kg
5. Water for kwātha	-	196.608lit
Reduced to	-	49.152lit
6. Guḍa	-	9.6kg
7. Dhātaki	-	3.84kg

Dose : 12-24 ml.

Anupāna : Water.

Therapeutic Uses

Grahaṇi, Pravāhika, Raktātisāra, Jwara.

Patrāngāsav

पत्राङ्गं खदिरं वासा शाल्मलीकुसुमं बला। भल्लातकं शारिवे द्वे जपाकुसुमस्फुटम्।।
आम्रास्थि दार्वी भुनिम्ब आफूकफलजीरकम्। लौहं रसाञ्जनं बिल्वं केशराजस्त्वचं तथा।।
कुङ्कुमं देवकुसुमं प्रत्येक पलसम्मितम्। सर्व सुचूर्णितं कृत्वा द्राक्षायाः पलविंशतिम्।।
धातकीं षोडशपलां जलद्रोणद्वये क्षिपेत्। शार्करायास्तुलां दत्त्वा क्षौद्रस्यार्द्धतुलां तथा।।
एकीकृत्य क्षिपेत् भाण्डे निद्ध्यान्मासमात्रकम्। हन्त्युमं प्रदरं सर्व श्वेतारूणं सवेदनम्।।
ज्वरं पाण्डुं तथा शोफं मन्दागित्वमरोचकम्।।

(भै. र. प्रदररोगाधिकार; ६६-१२२, १२६)

Ingredients

1. Patrāng	-	*25gm*

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2. *Khadirakāṣṭa*	-	*25gm*
3. *Vāsa Twak*	-	*25gm*
4. *Śālmali*	-	*25gm*
5. *Kuśuma*	-	*25gm*
6. *Bala*	-	*25gm*
7. *Bhallātaka*	-	*25gm*
8. *Śweta Śāriba*	-	*25gm*
9. *Kṛṣṇaśāriba*	-	*25gm*
10. *Japakusuma*	-	*25gm*
11. *Āmrasti*	-	*25gm*
12. *Dāruharidra*	-	*25gm*
13. *Bhūnimba*	-	*25gm*
14. *Aphim*	-	*25gm*
15. *Śwetajira*	-	*25gm*
16. *Lohabhasma*	-	*25gm*
17. *Rasānjana*	-	*25gm*
18. *Bilva*	-	*25gm*
19. *Bhṛngarāja*	-	*25gm*
20. *Dālcini*	-	*25gm*
21. *Keśar*	-	*25gm*
22. *Lavaṇa*	-	*25gm*
23. *Drākṣa*	-	*500gm*
24. *Dhātakipuṣpa*	-	*400gm*
25. *Water*	-	*12.5lit*
26. *Śarkara*	-	*2.5kg*
27. *Madhu*	-	*1.25kg*

Dose : 12-24ml

Anupāna : water

Therapeutic Uses

Śwetapradara, Raktapradara, Jwara, Pāṇḍu, Śotha, Mandāgni, Aruci.

Rohitakāriṣṭa

रोहीताकोतुलामेकान्चतुर्द्रोणे जले पचेत्। पादशेषेरसे पूते शीते पलशतद्वयम्।।
दद्याद् गुडस्य धातक्याः पल षोडशिका मता। पंचकोलं त्रिजातंच त्रिफलांच विनिक्षिपेत्।।
चूर्णयित्वा पलांशेन ततो भाण्डे निधापयेत्। (भै. र., प्लीहयकृद्रोगाधिकार; ८४-८५, १/२)

Ingredients

1. *Rohitak*	*19.2kg*
2. *Water*	*196.608lit*

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Reduced to	-	*49.152lit*
3. Guḍa	-	*38.4kg*
4. Dhātakipuṣpa	-	*3.072kg*
5. Pippali	-	*192gm*
6. Pippalimūla	-	*192gm*
7. Cavya	-	*192gm*
8. Citrak	-	*192gm*
9. Śuṇṭhi	-	*192gm*
10. Dālcini	-	*192gm*
11. Ela	-	*192gm*
12. Tejapatra	-	*192gm*
13. Āmalaki	-	*192gm*
14. Haritaki	-	*192gm*
15. Vibhitaki	-	*192gm*

Dose : 24ml

Anupāna : Water

Therapeutic uses

Udararoga, Plihavṛddhi, Gulma, Udara, Aṣṭīlavṛddhi, Saṇgrahaṇi, Arśa, Kāmala, Kuṣṭa, Śotha, Aruci.

Viḍangāriṣṭa

विडंगं ग्रन्थिकं रास्ना कुटजत्वक्फलानि च। पाठैलाबालुकं धात्री भागान्य चपलान्पृथक्।।
अष्टद्रोणेम्भसः पक्त्वा कुर्याद्द्रोणावशेषितम्। पूते शीते क्षिपेत्तत्र क्षौद्रं पलशतत्रयम्।।
धातकीं विंशतिपलां त्रिजातं द्विपलं तथा। प्रियंगुकान्चनाराणां सलोध्राणां पल पलम्।।
व्योषस्य च पलान्यष्टौ चूर्णीकृत्य प्रदापयेत्। (शा. ध. सं. मध्यमखण्ड, १० – ४७-५०)

Ingredients

1. Viḍanga	-	*480gm*
2. Pippalimūla	-	*480gm*
3. Rāsna	-	*480gm*
4. Kuṭajatwak	-	*480gm*
5. Kuṭajaphala	-	*480gm*
6. Pāṭha	-	*480gm*
7. Eluvaluka	-	*480gm*
8. Āmalaki	-	*480gm*
9. Water	-	*393.216lit.*
Reduced to	-	*24.576lit*
10. Madhu	-	*28.8kg*
11. Dhātaki	-	*1.92kg*

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12. Twak	-	*192gm*
13. Ela	-	*192gm*
14. Patra	-	*192gm*
15. Priyangu	-	*96gm*
16. Kāncanar	-	*96gm*
17. Lodhra	-	*96gm*
18. Śuṇṭhi	-	*768gm*
19. Maric	-	*768gm*
20. Pippali	-	*768gm*

Dose : 12-24ml

Anupāna : Water

Therapeutic Uses

Ūrustambh, Vidhradhi, Gaṇḍamāla, Bhagandar, Aśmari.

Sārasvatāriṣṭa

समूलपत्रशाखाया ब्राह्म्या ब्राह्ममुहूर्तके। गृहीत्वा विंशतिपलं पुष्ययोगे शतावरी।।
विदारिकाऽभयोशीराण्यार्द्रकं च तथा मिशिः। पञ्च पञ्च पलान्येषां जलद्रोणे पचेद्भिषक्।।
पादावशेषे विस्त्राव्य रसं वस्त्रेण गालयेत्। माक्षिकस्य दशपलं सितायाः पञ्चविंशतिः।।
धातकी पञ्चपलिका रेणुका त्रिवृता कणा। देवपुष्पं वचा कुष्ठं वाजिगन्धा बिभीतकी।।
अमृतैला विडङ्ग त्वक प्रत्येकं कर्षसम्मितम्। क्वाथे तस्मिन् समस्तानि समाक्षिप्य प्रयत्नतः।।
स्वर्णकुम्भे निदध्याद्वा भाजने मृण्मयेऽपि वा। स्वर्णस्य तनु पत्रं च क्षिप्त्वाऽस्मिन् कर्षसम्मितम्।।
मासाज्जातरसं दृष्टवा हेमपत्रे क्षयं गते। वाससा च परिस्त्राव्य स्थापयेद् घृतभाजने।।
सारस्वताभिदोऽरिष्ट एषोऽमृतसमः पुरा । शिष्याणामुपकारार्थ धन्वन्तरिर्विनिर्मितः।।
आयुवीर्यं स्मृतिं मेधां बलं कान्ति विवर्धयेत्। वाग्विशुद्धिकरो हृद्यो रसायनवरः स्मृतः।।
बालकानां च यूनां च वृद्धानां च सदा हितः। नरनारीहितो नित्यं परमोजस्करो मतः।।
वारयेत्स्वरकार्कस्य तथा चास्पष्टभाषणम्। स्वरं परभृतस्येव जनयेत् सेवनात् सदा।।
रजो दोषेण दुष्टानां योषितां शुक्रदोषिणाम्। पुंसां चापि शुभकरः सर्वदोषहरो मतः।।
अत्यध्ययनगीतादिक्षीणस्मृतिबलो नरः। लभन्ते चित्तसन्तोषं स्मृति चास्य निषेवणात्।।
पयसा सह पातव्योऽरिष्टोऽयं शाणमानतः। मासाभ्यां रोगहृच्चायं शरदा सर्वसिद्धिदः।।
अकालमृत्योर्हरणे यदीच्छा नारीप्रियत्वं यदि वाञ्छितं स्यात्।
वाकशुद्धिर्धैर्यस्मृतिलब्धरिष्टा निषेव्यतां तर्ह्यमृतं भर्वाद्भ :।। (भै. र. रसायने)

Apparatus required

Kaṣāya pātra, khalva yantra, sandhāna pātra, cloth etc.

Drugs required

Kwātha dravya

1. Brāmhī	:	*20 palas*
2. Śatāvarī	:	*5 palas*

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3. Vidārīkanda	:	*5 palas*
4. Harītakīphala twak	:	*5 palas*
5. Uśīra	:	*5 palas*
6. Ārdraka	:	*5 palas*
7. Śatapuṣpa	:	*5 palas*
8. water for kwātha preparation	:	*1 Droṇa*
Prakṣepa dravya		
9. Madhu	:	*10 palas*
10. Sita (sugar candy)	:	*25 palas*
11. Dhātakīpuṣpa	:	*5 palas*
12. Reṇuka	:	*1 karṣa (12 gms).*
13. Trivṛt	:	*1 karṣa (12gms)*
14. Gajapippalī	:	*1 karṣa (12 gms)*
15. Lavanga	:	*1 karṣa (12 gms)*
16. Vaca	:	*1 karṣa (12 gms)*
17. Kuṣṭha	:	*1 karṣa (12 gms)*
18. Aśvagandha	:	*1 karṣa (12 gms)*
19. Vibhītaka phala twak	:	*1 karṣa (12 gms)*
20. Guḍūci	:	*1 karṣa (12 gms)*
21. Sūkṣma ela	:	*1 karṣa (12 gms)*
22. Viḍanga	:	*1 karṣa (12gms)*
23. Dālcini (twak)	:	*1 karṣa (12 gms)*
24. Śodhita swarṇa pātra	:	*1 karṣa (12 gms)*

Procedure

First of all, No 1 to No. 7 all the drugs should be made into *yavakūṭa cūrṇa* and taken into *kaṣāya pātra* then added the mentioned quantity of water and *kwātha* is prepared by reducing the contents into 1/4th quantity over *mṛdwāgni*. Then this *kaṣāya* has to be filtered and collected into *Sandhāna pātra* then added the mentioned quantity of *madhu* and *śita* (sugar candy) and mixed well, kept as it is for one day, Next day *yavakūṭa curṇa* made from the drugs No. 12 to No 23 are added and mixed well, then *dhātakī puṣpa* which is properly dried in sunlight (without making *yavakūṭa cūrṇa*) is added and mixed well with hands. For the purpose of mixing *swarṇa patra* some quantity of liquid should be taken in an vessel from the above mixed contents and *swarṇa patra* is mixed in the liquid present in the vessel, then this liquid has to be again mixed in the total contents of *Sandhāna pātra* and mixed properly. Then according for fermentation and after fermentation contents are filtered, then after the proper filtration *Sandhāna pātra* has to be cleaned and dried well, then *sandhāna pātra* and kept for eight days, after the eight days the clear supernatant part should be sucked out with the help of rubber tube, then collected clear part of *sārasvatāriṣṭa* has to be filled in glass bottles and packed well and it should be used after passing the one year duration, this recipe is called *sārasvatāriṣṭa*. Usually this can be prepared within one-month duration.

Mātra : 1/4 tola

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Anupāna : Equal quantity of water

Karma : *Āyusya, vīrya vardhaka, smṛthi, meda, bala* and *kānti vardhaka, swarya, vākvisuddi kara, hṛdya, sreṣṭa rasāyana* and *ojovṛddikara*. This can be used routeinly as best therapy for increasing the *ojas* of *bāla, yuva, vṛdda, puruṣa* and *sthri*, *Santāna prāptikaram, smṛtikaram, bala karam.*

Āmayika prayoga

Swara roga, rajodoṣa, śukra doṣa etc.

Śārivādyāsav

शारिवां मुस्तकं लोध्रं न्यग्रोधं पिप्पली शटीम्। अनन्तां पद्मकं वालं पाठां धात्रीं गुडूचिकाम्।।
उशीरं चन्दनद्वन्दव यमानीं कटुरोहिणीम्। पत्रामेलाद्वयं कुष्ठं स्वर्णपत्रीं हरीतकीम्।।
एषां चतुः पलान् भागान् सूक्ष्मचूर्णीकृतान् शुभान्। जलद्रोणद्वये क्षिप्त्वा दद्याद् गुडतुलात्रयम्।।
पलानि दश धातक्या द्राक्षां षष्ठिपलां तथा। मासं संस्थापयेद् भाण्डे संवृते मृणमये शुभे।।

(भै. र. प्रमेहपिडकाधिकार; २२-२५)

Ingredients

1. Śāriva	-	*3.90kg*
2. Musta	-	*3.90kg*
3. Lodhra	-	*3.90kg*
4. Nyagrodha	-	*3.90kg*
5. Pippali	-	*3.90kg*
6. Ṣaṭi	-	*3.90kg*
7. Ananta	-	*3.90kg*
8. Padmaka	-	*3.90kg*
9. Hribera	-	*3.90kg*
10. Pāṭha	-	*3.90kg*
11. Āmalaki	-	*3.90kg*
12. Guḍūci	-	*3.90kg*
13. Uśīra	-	*3.90kg*
14. Śwetacandana	-	*3.90kg*
15. Raktacandana	-	*3.90kg*
16. Yamāni	-	*3.90kg*
17. Kaṭukarohiṇi	-	*3.90kg*
18. Patra	-	*3.90kg*
19. Bṛhat ela	-	*3.90kg*
20. Sūkṣma ela	-	*3.90kg*
21. Kuṣṭa	-	*3.90kg*
22. Swarnapatri	-	*3.90kg*
23. Haritaki	-	*3.90kg*
24. Water	-	*50lit*

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25. Guḍa - *29.62kg*
26. Dhātaki - *0.976kg*
27. Drākṣa - *5.696kg*

Dose : 12-24ml

Anupāna : Water

Therapeutic Uses

Vātarakta, Meha, Pramehapiḍika, Upadaṁsa, Bhagandara

●

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Chapter 21

PATHYA KALPANĀ

A good and proper diet in disease is worth a hundred medicines and no amount of medication can do good to a patient who does not observe a strict regimen of diet. Our *Āyurveda,* instead of being content with specifying the nature of diet in diseases in general, mentions the names of articles, which should, or should not be taken in any specific malady, judged by the light of their properties of aggravating *vāta, pitta, kapha.* The dietic or therapeutic properties of a large number of articles of human consumption, as well as the chemical changes they undergo in the digestive apparatus of different mammals have been studied and analysed, and so we find in our *saṁhitas*, such injuctions that barley corns passed undigested with the faeces of a cow or horse, should form the diet of a *prameha* patient. That the milk of a she- camel should be given to a patient suffering from a cutaneous affection, and that the flesh of any carnivorous beast or bird should be given to one suffering from pulmonary consumption and so on. It was a cardinal doctrine with *Āyurvedic dietists* that the longing of a patient for any particular kind of food in a certain disease, emphatically shows that this organism is in want of those elements which enter into the composition of the article offered. Hence elaborate dietetics were formulated, which cannot but be acceptable to the most fastidious patient.

The exclusion of salt and water from the food of an ascites or anasarca patient as laid down in our *Saṁhitas* shows that our *Ṛṣi* possessed a higher chemical knowledge regarding the effects of organic matter on the human system than many of us are ready to accord these poineers in medical science.

In modern science, food articles are primarily classified depending upon their chemical composition namely carbohydrate, protein, fat, vitamins, minerals, etc. In *Āyurveda*, such classification is based on the biological action of the food articles and their *rasa* (taste). For example, all varieties of rice may be treated as of one group on the basis of their carbohydrate content. But *Āyurveda* considers that freshly harvested rice is heavy for digestion. It aggravates *kapha.* If used continuously, it is considered to produce many complications. But old rice stored for over six months is considered to be light and more useful for an average person. The freshly harvested rice procudes more fat in the body that the old rice. Thus, for an emaciated individual having good digestive power, freshly harvested rice is nutritious, whereas for a fatty person, even without good digestive power, old rice is nutritious.

There are three types of rice, namely, *śāli, ṣaṣṭika* and *vrihi.* Botanically all of them belong to the same family and species, Their botanical name is *Oryza sativa Linn.* But, according to *Āyurveda* there is a great difference in their nutritive value. Wheras *śāli* and *ṣaṣṭika* alleviate *doṣas* and maintain their equilibrium, the third type of rice aggravates them.

There are many other types of food ingredients which chemically contain starch. But they are considered to produce a depletive effect on the human body. For example *koradūṣa* (*Paspalum scrobiculatum Linn.*) type of corn produces depletive effect and reduces fat of the body expeditiously.

Pulses contain mostly protein. But, according to *Āyurveda,* some of them like *māṣa (Phaseolus radiatus Linn.)* is heavy for digestion and it produces more fat in the body whereas *mudga (Phaseolus mungo Linn.)* is considered to be light for digestion and it reduces fat in the body. *Kulattha (Dolichos biflorus Linn)*, on the other hand, is exceedingly nutritious for such type of patients.

Āyurveda lays great deal of emphasis upon proper diet for the treatment of patients. For each and every disease wholesome and unwholesome food ingredients have been described.

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In *Āyurveda*, ingredients used for food and drinks have been classified into 12 groups as follows:

1. *Śūkadhanya* (corns with bristles).
2. *Śamīdhānya* (pulses)
3. *Māṁsa* (meat)
4. *Śāka* (vegetables)
5. *Phala* (fruits)
6. *Harita* (salads)
7. *Madya* (wines)
8. *Ambu* (water)
9. *Gorasa* (milk and milk products)
10. *Ikṣuvikāra* (products of sugar-cane)
11. *Kṛtānna* (food preparations)
12. *Āhārayogi* (accessory food articles)

In *Kāśyapa saṁhiāa ragrding the importance of diet* is mentioned like wise :

अतश्चं सर्वभूतानामाहारः स्थितिकारणम्। न त्वाहारदृतेऽस्त्यत् प्राणिनां प्राणाधारणम्।।
न चाहारसमं किञ्चिद्भैषज्यमुपलभ्यते। शक्यतेऽप्यन्नमात्रोण नरः कर्तुं निरामयः।।
भेषजेनोपपन्नोऽपि निराहारो न शक्यते। तस्माद्भिषग्भिराहारो महाभैषज्यमुच्यते।।

(का. सं. खि. ४.४-६)

Food is said to be cause of stability for all the living beings. There is nothing else except diet for sustaining the life of living beings. Any other medicament just like diet is not available, one is capable to make man disease- free only with the cereals (congenial diet). One is not able (to sustain life) without diet even of endowed with medicine, that is why the diets said to be the great medicament by physician.

Caraka, suśruta and *Vāghbhaṭācārya's* also accepted the importance of diet specially the benificial one. Diet is said to be basis of life, strenght , complexion, ojas, growth and development, perspicuity of indriyas, happiness clarity of voice, lusture, pleasure, increase of *dhātus*, intellect, health etc. entire life of individual depends upon food, all the activities of this world, as well- as efforts made for eternal emancipation depend upon diet, thus cereals are the greatest in comparison to other things.

In this chapter food preparations are being described . The properties of such food preparations are sometimes natural and some times they result from the special method of preparation involoved like combination etc.

Here in is described in brief the anna *prakriya* (preparation of rice puddings). *Ācaryā Suśruta* has mentioned mainly the four types of *Pathya Kalpanā* like wise :

Maṇḍa Kalpanā

सिक्थकैः रहितो मण्डः पेयासिक्थसमन्विता। यवागूर्बहुसिक्था स्यात् विलेपी विरलद्रवा।।

(सु. सू. ४६/३४४)

When rice boiled properly with water, the obtained liquid portion is called *maṇḍa*.

नीरे चतुर्दशगुणे सिद्धो मण्डस्त्वसिक्थकः। शुण्ठीसैन्धवसंयुक्तः पाचनो दीपनः स्मृतः।।

(शा. म. २/१७२)

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One part of rice and fourteen parts of water are boiled together, when rice is boiled properly, the contents are filtereed and obtained liquid portion is called *maṇḍa kalpanā*. This fluid mixed with powder of sunthi and *saindhava lavaṇa* is a good *dīpana-pācana*.

Ācārya caraka mentioned about pharmacological actions of *maṇḍa kalpanā* like viz:

मण्डस्तु दीपयत्यग्निं वातं चाप्यतुलोमयेत्। मृदूकरोति स्त्रोतांसि स्वेदं संजनयत्यपि।।
लङ्घितानां विरिक्तानां जीर्णे स्नेहे च तृष्यताम्। दीपनत्वाल्लघुत्वाच्च मण्डः स्यात् प्राणधारणः।।
(च. सू. अ. २७/२५१-२५२)

Maṇḍa kalpanā is agni *pradīptakaram, vātānulomanam, śrotomṛdukaram swedajananam.* By virtue of its *laghu guṇa* and *dīpanakarma, maṇḍa kalpanā* is sustainer of life of those who have undergone *langhana karma, virecana karma* and those who are suffering from trsna after the *sneha pana* has been digested.

Aṣṭaguṇa maṇḍa

धान्यत्रिकटुसिन्धूत्थमुद्गतण्डुलयोजितः। भृष्टश्च हिङ्गुतैलाभ्यां स मण्डोऽष्टगुणः स्मृतः।।
दीपनः प्राणदो बस्तिशोधनो रक्तवर्धनः। ज्वरजित्सर्वदोषघ्नो मण्डोऽष्टगुण उच्यते।।
(शा. स. म. ख. ३/१७१-१७३)

Maṇḍa prepared with *dhānya, trikaṭu, saindhava, mudga* and *taṇḍula* and added with fried *hiṅgu* is *aṣṭa guṇa maṇḍa* this acts as *dīpana, prāṇada, bastiśodhana, rakta vardhana*, relieves *jwara* and all the three *doṣas*.

Vāṭyamaṇḍa

सुकण्डितैस्तथा भृष्टैर्वाठ्यामण्डो यवैर्भवत्।। कफपित्तहरः कठ्यो रक्तपित्तप्रसादनः।
(शा. स. म. ख. ३/१७१-१७३)

Maṇḍa prepared with broken and fried *yava* (barley) grain is *kaphapittahara, kaṇthya, raktapitta prasādana.*

Lājamaṇḍa

लाजैर्वा तण्डुलैभृष्टैर्लाजमण्डः प्रकीर्तितः। श्लेष्मपित्तहरो ग्राही पिपासाज्वरजिन्मतः।।
(शा. स. म. ख. ३/१७४-१७५)

Maṇḍa prepared with *lājā* (parched rice) is *śleṣmapittahara, grāhī*, relieves *pipāsā* and *jwara*.

Ācārya caraka has mentioned the pharmacological actions of *lājā maṇḍa* (*lājāpeya*) likewise.

लाजपेया श्रमघ्नी तु क्षामकण्ठस्य देहिनः। तुष्णातीसार शमनो धातुसाम्बकरः शिवः।।
लाजमण्डोऽग्निजननो दाहमूर्च्छा निवारणः। मन्दाग्निविषमाग्नीनां बालस्थविरयोषिताम्।।
देयश्च सुकुमाराणां लाजमण्डः सुसंस्कृतः।। (च. सू. २७/२५३-२५५)

Maṇḍa prepared of fried paddy removes fatigue of persons whose voice is weakened and this *lājā maṇḍa* alleviates *tṛṣna, atisāra*, maintains the normalcy of *dhātus, kalyāṇa karam* jaṭarāgni *pradīpta karam, dāha mūrcā nivaranam.*

This *lājamaṇḍa* when properly prepared with *dhānyak, pippali (susamskṛta)* is prescribed for persons having *mandāgni, viṣamāgni* and children, women, old persons and persons of tender health.

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Yavāgu

साध्यं चतुष्पलं द्रव्यं चतुःषष्टिपले जले। तत्क्वाथेनार्धशिष्टेन यवागूं साधयेद्घनाम्।।

(शा. म. २/१५४)

Four *palas* of drug is boiled in sixtyfour *palas* of water and reduced to half. In this decoction broken grains are added and thick gruel prepared. This is called *yavāgu. Ācaryā Śāraṅgadhara also* mentioned another *paribhāṣa* of *yavagu.*

आम्राम्रातकजम्बूत्वक्कषाये विपचेद्बुधः। यवागूं शालिभिर्युक्तां तां भुक्तवा ग्रहणीं जयेत्।।

(शा. स. म. ख. २/१५३)

An *yavāgu* prepared with barks of *āmra, āmrātaka, jambū* and broken rice relieves *grahaṇi.*

Peya

द्रवाधिका स्वल्पसिक्था चतुर्दशगुणे जले। सिद्धा पेया बुधैर्ज्ञेया यूषः किंचिद्घनस्तः।।
पेया लघुतरा ज्ञेया ग्राहिणी धातुपुष्टिदा। यूषो बल्यस्ततः कण्ठ्यो लघुपाकः कफापहः।।

(शा. स. म. ख. ३/१६७-१६९)

One part of *dravya* (grain- rice etc.) and fourteen parts of water, are boiled into watery consistence, is called *peya* and it contains more liquid portion (according to taste and requirement *lavaṇa, pippali, śuṇṭhi, marīca* etc. are mixesd in *peya* while consuming).

Peya guṇa

Laghutara, grāhi, dhātu puṣṭi karam.

Where as *yūṣa* also can be prepared with same proportion of *dravya* (*mudga* etc.) and water, but it is prepared in thick consistency. *Yūṣa* is *balya, kaṇṭhya, kaphahara.*

Vilepī

विलेपी घनसिक्था स्यात्सिद्धा नीरे चतुर्गुणे। तर्पणी बृंहणी हृद्या मधुरा पित्त नाशिनी।।

(शा. स. म. ख. ३/१६६-१६७)

Vilepī is prepared with one part of grain (rice) and four parts of water cooked into a thick paste form (till water portion get evaporated). According to taste *marīca, pippali, saindhava lavaṇa* etc. are added in appropriate quantity while consuming.

Vilepī guṇa

It is *tarpaṇa, bṛṃhana, hṛdya, madhura* and *pittanāśana.*

Anna (Bhakta or Bhāt) kalpanā

भक्तमंत्र तथाऽन्धश्च क्वचित्कूरं च कीर्तितम्। ओदनोऽस्त्री स्त्रियां भिस्सा दीदिविः पुंसि भाषितः।।
सुधौतांस्तण्डुलान् स्फीतांस्तोये पञ्चगुणे पचेत्। तदुक्तं प्रस्रुतं चोष्णं विशदं गुणवन्मतम्।।
भक्तं वन्हिकरं पथ्यं तर्पणं रोचनं लघु। अधौतमस्त्रुतं शीतं गर्वरुच्यं कफप्रदम्।।

(भा. प्र. कृतान्नवर्ग)

Ācārya ḍalhaṇa mentioned the 1:5 ratio of rice and water for the preparation of anna *kalpanā.* Regarding *anna kalpanā, Ācaryā bhāvamiśra* mentioned likewise. *Anna kalpanā* synonyms. *Bhakta andha, kūra, odana, bhissa, dīdivi.*

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Preparation method

1 part of rice *(taṇḍula)* cleaned with water 3 to 4 times, then mixed with 5 times of water in a vessel and it is covered with lid, then cooked, once *(phena)* foam is produced, then lid has to be taken out. When rice is properly cooked vessel is taken out and liquid portion is filtered with cloth. Obtained solid cooked rice is called *anna kalpanā*. If necessary after the rice is cooked prop-erly, the remained liquid portion (*maṇḍa*) also evaporated by heating and like this prepared anna is very much useful for the tratment of *atisāra*.

Guṇa of anna kalpanā

धौतस्तु विमलः शुद्धो मनोज्ञः सुरभिः समः । स्विन्न सुप्रस्रु तस्तूष्णो विशदस्त्वोदनो लघुः ।।
अधौतोऽप्रस्रु तोऽस्विन्नः शीतश्चाप्योदनो गुरुः ।। (सु. सू. ४६/३४६-३४७)

Sudhauta prasruta (Rice prepared after washing and when rice properly cooked, liquid portion has to be filtered) *anna kalpanā. Uṣna, viśada, dīpana, pathya, tarpaṇa, rocana* and *laghu. Adhautāsruta anna kalpanā* (Rice prepared without washing and by evaporating all liquid portion) : *Śīta, guru, arucidāyaka, kapha vṛddi karam.*

Ācāryā Śārṅgadhara concept regarding *anna kalpanā* :

जले चतुर्दशगुणे तण्डुलानां चतुष्पलम् । विपचेत् स्रावयेन्मण्डं स भक्तो मधुरो लघुः ।। (शा. म. २/१७२)

Four *palas* of rice and fourteen parts of water are boiled together and the fluid drained out while boiling gives *bhakta* (cooked rice). This is *madhura* and *laghu*. Here *Ācaryā Śāraṅgadhara* advised 14 times of water for the preparation of *bhakta kalpanā* may be because for getting both *maṇḍa kalpanā* (liquid portion) and *bhakta* (*sikta* or cooked rice) together more quantity of water is required to be added for the prepartion.

Kṛśarā kalpanā

Generally it is called *khichaḍī* and it is mainly prepared by combination of rice and *mudga* and it is very commonly prescribed diet for *atisāra.*

Taṇḍula	:	1 part
Water	:	6 parts
Mudga	:	1/4th part

Lavaṇa, ārdraka, hingu, haridra : appropriate quantity.

तण्डुलादालिसम्मिश्रा लवणार्द्रकहिङ्गुभिः । संयुक्ताः सलिले सिद्धाः कृशरा कथिता बुधैः ।।
कृशरा शुक्रला बल्या गुरुः पित्तकफप्रदा । दुर्जरा बुद्धिविष्टम्भिमलमूत्राकरी स्मृता ।।
(भा. प्र. मि. प्र. कतात्रा)

कफपित्तकरी बल्या कृशराऽनिलनाशनी । (सु. सू. ४६/३४६)

Procedure

Appropriate quantity of *taṇḍula* (rice), *mudga lavaṇa, ārdraka, hingu, haridra* are taken in a vessel and mixed with six times of water and cooked well. Here water quantity is not specified, hence 6 times water can be taken for proper preparation. Generally *mudga* is taken as 1/4th quantity of the *taṇḍula* and *lavaṇa, ārdraka, hingu, haridra* are to be taken in appropriate quantity.

Guṇas of kṛśara

Śukrala, balya, guru, pitta vardhaka, sleṣma vārdhaka, vātānaśaka, it digests slowely, buddiprada, viṣṭambhī, malamūtra utpādakaram.

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Khaḍa-Kāmbalika

खड काम्बलिकौ यूषविशेषौ । तत्रा खडो द्विविध: – सतकशमीधान्य:, सतकशाकश्च ।

(सु. सू. डल्हण ४६/३७६)

Ācaryā dalhaṇa considered *khaḍa* and *kāmbalika* as *yūṣa viśeṣa.*

Khaḍa

सतकाणि शमीधान्यानि स्निग्धानि–संग्राहकाणि खडानि ।

Khaḍa is two types.

Satakaśamīdhānya

2 lit. of *takra* and any one among *mudga-māṣa-tila* etc. *śamīdhānya* 125 gms is to be taken (External cover should be removed for *mudga, māṣa*) in an earthen pot and heated over *mandāgni* till contents are reduced to half of the total quantity if *śamidhānya* is not properly cooked then contents are cooked till they are reduced to 1/4th of the total quantity. Then appropriate quantity of *ghṛta bharjita jīraka-marīca* etc. are mixed properly obtained product is called *satakaśamīdhānya khaḍa.*

Satakaśāka

कपित्थतक्रचाङ्गेरीमरिचाजाजिचित्राकै: । सुपक्व: खडयूषोऽयम् ..... ।।

2 lit of takra and 125 gm of *yoga* made with *kapitha*, *cāṅgerī*, *marīca*, *jīraka*, *citraka* are taken and cooked over *mandāgni*. When it is properly cooked or when contents are reduced to half of the total quanity, then vessel is taken out from fire and obtained product is called *satakaśāka khaḍa.*

Kāmbalika

Procedure No.:1

काम्बलिकोऽपर: । दध्यम्ललवण स्नेह तिलमाष समन्वित: ।। (सु. सू. डल्हण ४६/३७६)

2 lit. of *āmla dadhi* and tila or *māṣa* 125 gms are taken and *yūṣa* is prepared with these, then appropriate quanity of *sneha* (*ghṛta* etc.) *lavaṇa* are mixed properly and obtained product is called *kāmbalika.*

No.: 2

दधिमस्त्वम्लसिद्धस्तु यूष: काम्बलिक: स्मृत: ।। (सु. सू. डल्हण ४६/३८१)

दधिमस्त्वम्लसिद्धस्तु यूष: काम्बलिक: स्मृत: ।

पुन: सौर्वचलाजाजी बीजपूरक सौरभै: । संयोज्य मथित: स्वच्छ एष काम्बलिको भवेत् ।।

(सु. सू. डल्हण ४६/३७६)

Dadhimastu or supernatent part of water which is separated from *dadhi* is to be taken in 2 lit. quantity and *mudga* or *māṣa* 125 gm are taken in a vessel and cooked till contents are reduced to half of the quantity and *yūṣa* is prepared, then appropriate quantity of *sauvarca lavaṇa, jīraka, bījapūraka nimbu*, ela, *lavanaga, jāpatri, keśara* etc. *sugandhi dravyas* are mixed and curned well then it is called *kāmbalika.*

Gunas of kāmbalika and khaḍa

खडकाम्बलिकौ हृद्यौ तथा वातकफे हितौ। बल्य: कफानिलौ हन्ति दाडिमाम्लोऽग्निदीपन: ।।

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दध्यम्लः कफकृद् बल्यः स्निग्धो वातहरो गुरुः। तक्रम्लः पित्तकृत् प्रोक्तो विषरक्तप्रदूषणः।।

(सु. सू. ४६/३७६-३७७)

दाडिमेन क्रियते योऽम्लो यूषः स दाडिमाम्लः। दध्यम्ल इति दध्ना क्रियते योऽम्लो यूषः स दध्यम्लः।।

तक्राम्लोऽप्येवम्। दाडिम धान्याम्लदधितक्रैरम्लत्वं काम्बलिकस्यैव इत्येके।। (डल्हण व्याख्या)

Both *khaḍa* and *kāmbalika* are *hṛdaya*, *vāta* and *kaphavikāraharam*. *Kāmbalika* prepared from *dāḍimāmla* is *agni prādīptikaram*, *balyam kapha* and *vātavikāra haram*.

Kāmbalika prepared from *āmla dadhi* is *kapha vṛddikaram*, *balya, snigdha, vāta haram, guru*. *Kāmbalika* prepared from *takrāmla* is *pittakaram, viṣajanaka, raktadūṣita*.

Rāga- Ṣāḍava

Rāga

सितारुचक सिन्धूत्थैः सवृक्षाम्लपरूषकैः। जम्बूफलरसैर्युक्तो रागो राजिकया कृतः।।

Appropriate quantity of *sita* (sugar candy), *Saurcalavana, saindhava lavaṇa*, *vṛkṣāmla swarasa, parūṣaka swarasa*, *jambūphala swarasa* are mixed together and grinded well , then little quantity *rājika* is added and again grinded well then it is called *Rāga* and it should be preserved in glass container,

Ṣāḍava

षाडवाः पुनर्मधुराम्ललवण संयोगजा नानाविधाः। (सु० सू० डल्हण ४६.३८३)

By making combination of *madhura, āmla*, *lavaṇa rasa dravya* different types of *ṣāḍava* can be prepared.

Some of the *Ācaryās* considered both *rāga* and *ṣāḍava* as one *Kalpanā* under the title of *Rāgaṣāḍava*.

स्पष्टाम्लमधुरोऽअस्पष्ट कषायलवणोषणः। अतिक्तः खाडवः कोल कपित्थाद्यु पबृंहितः।।

(सु. सू. डल्हण ४६/३७८)

Rāgaṣāḍava can be prepared out of any one of thedrugs E.g. *apakva āmra, kapittha, jīraka, kola cūrṇa, mātulunga* etc.

Ācaryā soḍhala in his *gadanigraha* mentioned about different types of *ṣāḍava* e.g. *kapittha ṣāḍava, cūrṇaṣāḍava*, *drākṣaṣāḍava*, *guṭikāṣāḍava* etc.

Guṭikāṣādava

कपित्थकाम्राणि सदाडिमानि पिष्टानि सूक्ष्मं सितया युतानि।
सबीजपूराम्बुविभावितानि सन्तर्पणोऽयं गुटिकाख्यषाडवः।।

(ग. नि. वाजी. १०५)

Required quantity of *kapittha*, *āmra*, *dāḍima* etc. fruits are collected and grinded well then mixed with equal part of sugar, then added the apropriate quantity of *bījapūranimbuswarasa* and grinded well, then this material is moulded in to *guṭikā* form and it is called *guṭikāṣaḍava*.

Another method of Rāga ṣāḍava

आममाम्रं त्वाचाहीनं द्विस्त्रिर्वा खण्डितं ततः। सुपक्वं च समुत्तार्य मरिचैलेन्दुवासितम्।।

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स्थापितं स्निग्धमृद्भाण्डे रागषाडवसंज्ञितः।। (वै. श. सि.)

External layer and seed is removed from *apakva āmraphala* and it is made in to 2 or 3 pieces and mixed with 4 times of water and cooked well. When it is properly cooked, then vessel is taken out from the fire then *marīca, ela, karpūra cūrṇa* is added and mixed well. Then it is called *rāgaṣāḍava kalpanā* and it is preserved in *ghṛta lipta bhāṇḍa.*

Rāga-ṣāḍavaguṇa

रूचिष्यो लघुपाकश्च दोषाणां चाविरोधकृत। (सु. सू. ४६/३६८)

लघवो बृंहणा वृष्या हृद्या रोचनदीपनाः। तृष्णमूर्च्छाभ्रमच्छार्दि श्रमघ्ना रागषाडवाः।।

(च. सू. ४६/३८३)

कट्वम्लस्वादुलवणा लघवो रागषाडवाः। मुखप्रियाश्च हृद्याश्च दीपना भक्तरोचनाः।।

(च. सू. २७/२८१)

Rucikaram, laghu pāki, laghu, bṛṁhaṇam, Vṛṣya, hṛdya, rocana, agnidīpana.

Āmayika Prayoga

Tṛṣṇa, mūrccha, bhrama, chardi, śramanāśaka.

Takra Kalpanā (Takravarga)

यथा सुराणाममृतं प्रधानं तथा नराणां भूवि तक्रमाहुः।

According to *Āyurveda, takra* is considered as *Amṛta.*

रूक्षमर्धोद्घृतस्नेहं यतश्चानुद्घृतं घृतम्। तक्रं दोषाग्निबलवित् त्रिविधं तत् प्रयोजयेत्।।

(च. चि. १४/८४)

On the basis of presence or absence of *sneha, Ācaryā caraka* mentioned three types of *takra.*

Rūkṣa

Completely butter will be separated.

Ardha snehyukta

Half of the quantity of butter will be separated.

Purna snehayukta

It will be prepared without separating butter.

घोलं तु मथितं तक्रमुदश्विच्छंच्छिकाऽपिच। ससरं निर्जलं घोलं मथितं त्वसरोदकम्।।

तक्रं पादजलं प्रोक्तमुदश्वित्त्वर्धवारिकम्। छच्छिका सारहीना स्यात्स्वच्छा प्रचुरवारिका।।

(भा. प्र. पू. तक्रवर्ग)

Depending upon amount of *sneha* presence and also variation of water quantity, accordingly the *takra kalpanā* is mentioned following varieties in *Bhāvaprakasā.*

1. Ghola, 2. Mathita, 3. Takra, 4. Udaśvita, 5. Chacchikā

Ghola

यत्तु सस्नेहमजलं मथितं घोलमुच्यते। (सु. सू. ४५/८५)

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Without adding water *dadhi* is churned well and obtained product(*sneha yukta*) is called *ghola*.

Guṇas of ghola

घोलं तु शर्करायुक्तं गुणैर्ज्ञेयं रसालवत् । वातापित्तहरं ह्लादि..... ।। (भा. प. पू. तक्रवर्ग)

If *ghola* is administered along with *śarkara*, then it will produce effect equal to that of *Rasāla* (*srīkhaṇḍa* or *lassi*). It is *vāta pittanaśaka āhlādakaram, śukrala, balya, rucikara, dīpana, bṛmhaṇa, snigdha*.

Āmayika prayoga

Rakta pitta, tṛṣṇa, dāha, pratiśyāya.

Mathita

मथितं कफपित्तनुत्..... । (भा० प्र०)

Without adding water *dadhi* has to be churned and butter will be separated and obtained product is called *mathita*.

Karma of mathita

Kaphapittaharam.

Takra

मन्थनाद पृथग्भूतनेहमर्धोदकं च यत् । नातिसान्द्रं द्रवं तक्रं स्वाद्वम्ल तुवरं रसे ।। (सु. सू. ४५/८५)

तक्रं तु मधुरमम्लं कषायनुरसं उष्णवीर्यं लघुरूक्षमग्निदीपनं गरशोफातिसार ग्रहणीपाण्डुरोगार्श: प्लीगुल्मारोचक विषमज्वर तृष्णाच्छर्दिप्रसेक शूलमेद: श्लेष्मानिलहरं मधुरविपाकं हृद्यं मूत्राकृच्छ्रस्नेहव्यापत् प्रशमनमवृष्यं च । (सु. सू. ४५/ ८४)

शोफार्शो ग्रहणीदोष मूत्रां ग्रहोदरारुचौ। स्नेहव्यापदि पाण्डूत्वे तक्र दद्याद् गरेषु च ।। (च. सू. २७/२२९)

वातश्लेष्मार्शसां तक्रात् परं नास्तीह भेषजम् । (च. चि. १४/ ७७)

वातश्लेष्मविकाराणां शतं चापि निवर्तते । नास्ति तक्रात् परं किञ्चिदौषधं कफवातजे ।। (च. चि. १४/७७)

स्रोत:सु तक्रशुद्धेषु रस: सम्यगुपैति य: । तेन पुष्टिर्बलं वर्ण: प्रहर्षश्चोपजायते ।। (च. चि. १४/८७)

Ācaryā suśruta mentioned that one part of *dadhi* is to be mixed with half of the water and churned well. Then butter will be separated. This will be neither more concentrated form nor diluted form and it will have *madhura, āmla, kaṣāya rasa.*

Pharmacological Properties

Rasa	:	*Madhura, amla and kaṣāya anurasa.*
Guṇa	:	*Laghu, rūkṣa*
Vīrya	:	*Uṣna*
Vipāka	:	*Madhura*
Karma	:	*Agnidīpana, hṛdya, avṛṣya, kaphavāta haram.*

Āmayika Prayoga

Garaviṣa, sopha, atisāra, grahaṇi, pāṇḍu, arśa, plīharoga, aruci, viṣamajwara, vamana, tṛṣṇa,

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atilālastrāva śula, medoroga, mūtra, kṛcchra, diseases produced because of *ayoga* and *atiyoga* of *sneha.*

For the treatment of *kapha* and *vāta vyādies, takra* is considered as a best remedy.

For the treatment of *vātasleṣmajanya arśa, takra* is considered as best dietic regimen.

Because of *takra*, administration *srotas* will get cleared, ultimately *bala, varṇa, harṣa* are enhanced.

Udaśvit

उदशिवत् कफकृद् बल्यमामघ्नं परमं मतम् । (भा. प्र.)

One part of *dadhi* is mixed with half part of water and churned well and then produced product is called *udaśvit*. Here butter is not separated.

Karma : *Kaphaprakopakaram, balya, āmadoṣanāśaka.*

Chacchikā

छच्छिका शीतला लघ्वी पित्तश्रमतृषाहरी । वातनुत् कफकृत् सा तु दीपनी लवणान्विता ।। (भा. प्र.)

Dadhi is mixed with more quantity of water and churned well obtained product is called *chacchikā.*

Pharmacological actions of chacchikā

Guṇa : *Śītala, laghu.*

Karma : *Kapha karam,* if it is administered after mixing with *saindhavalavaṇa* it acts as *dīpana, pācana.*

Āmayika prayoga : *Śrama, tṛṣṇa, pittavikāra, vātavikāra.*

Indications of takra

शीतकालेऽग्निमान्द्ये च कफोत्थेष्वामयेषु च। मार्गावरोधे दुष्टे च वायौ तक्रं प्रशस्यते।।

(सु. सू. ४५/८७)

In *śītakāla, agnimāndhya, kaphavikāra, mārgāvarodha, vāta vikāra* etc. conditions *takra* is best diet for administration.

Contra indications of takra

नैव तक्रं क्षते दद्यान्नेष्णकाले न दुर्बले । न मूर्च्छाभ्रमदाहेषु न रोगे रक्तपैत्तिके ।। (सु. सू. ४५/८६)

Kṣata, uṣṇa kāla, durbalata, mūrcchā, bhrama, dāha raktapitta.

Kaṭvara

दध्नः ससारकस्यात्रा तक्रं कट्वरमिष्यते। तक्रं ह्युदशिन्मथितं पादाम्ब्वर्धाम्बु निर्जलम्।।

(परिभाषा प्रदीप)

Curd should be mixed with 1/4th part of water and churned, then produced *takra* is called *kaṭvara.*

After chunring produced *sneha* (butter) should be separated.

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Dadhikūrcikā- Takradūrcika

दध्ना सह पयः पक्वं सा भवेद् दधिकूर्चिका । तक्रेण पक्वं यत् क्षीरं सा भवेत्तक्रकूर्चिका ।।

(वैद्यक परिभाषा प्रदीप)

Milk and curd are collected together in an earthen pot and heated with fire, and prepared semisolid(Kova) like material is called *dadhi kūrcikā*.

If milk and takra mixed together and cooked till it becomes semisolid (kova) like material and it is called *takrakūrcika*.

Yūṣa, *māṁsarasa*, *veśavāra* etc. *pathya kalpanā* are mentioned in previous chapters.

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Chapter 22

BĀHYA KALPANĀ

(Formulations intended for External use)

As it is mentoioned in *Āyurveda*, the treatment is of two types, viz:

1. Antahparimārjana 2. Bahiparimārjana

The later one called *Bahiparimārjana* means, the medicine intended for external use only. For that purpose in *Āyurveda* different forms of external applications are described for the conviniency of treatment of different diseases. They are *Lepa Kalpanā, Upanāha, Malaharakalpanā* etc. As mentioned in modern Pharmaceutics, Ointments, Creams , pastes, Jellies etc. external applications.

Lepakalpanā

आलेपस्य च नामानि लिप्तो लेपश्च लेपनम् । (शा. सं. उ. ख. २/१)

Synonyms : *Ālepana* (topical application) also known as *lipta, lepa, lepana.*

Medicines in the form of a paste used for external application are called *lepas*. The drugs are made in to a fine powder form. Before use on the body, it is mixed with some liquid or other medium indicated in each preparation and made in to a soft paste. Water, cow's urine, oil and ghee are some of the media used for mixing.

द्रव्यमार्द्रं शिलापिष्टं शुष्कं वा सद्रवं तनु । देहे प्रलेपनार्थं तल्लेप इत्युच्यते बुधैः ।। (द्र. गु. वि. यादवजी)

Wet medicinal drugs are made in to *Kalkā* (paste) form, if drugs are in dry state , they are converted in to *Kalkā* (paste) form by adding little quantity of water and grinding. This *Kalkā* is used as external application and it is called *lepa kalpanā*. Pharmaceutically *lepa kalpanā* is a form of *kalkā kalpanā*. While in clinical application, *lepa kalpanā* is only meant for external application purpose, where as *kalkā* very commonly used for internal administration.

Importance of *lepa kalpanā* : In *Suśruta Saṁhitā*, in the context of *Vraṇa* and *Śopha* treatment *ālepa* is given prime importance.

यथा प्रज्वलिते वेश्मन्यम्भसा परिषेचनम् । क्षिप्रं प्रशमयत्यग्निमेवमालेपनं रूजः ।।

प्रह्लादने शोधने च शोफस्य हरणे तथा । उत्सादने रोपणे च लेपः स्यात्तु तदर्थकृत् ।। (सु. चि. १/१५-१६)

While explaining the efficacy of *lepas* it is mentioned that, by pouring water, over a burning house, how the fire is get stopped immediately, same manner by application of *lepa* provoked *doṣas* of *Vraṇa* (*Vedana, Śotha* etc. complications of *Vraṇa*) will get subsided. *Lepa* is having actions like *Śodhana, Utsādana, Ropaṇa* etc.

Different scholars of *Āyurveda* have mentioned different types of *lepas* on the basis of the drugs used for preparation, mode of administration, and its usage.

According to *Ācārya Suśruta lepa* is of three varieties viz:

स त्रिविधः प्रलेपः प्रदेहः आलेपश्च । (सु. सू. १८/६)

1. Pralepa, 2. Pradeha, 3. Ālepa

According to *Aṣṭāṅga Saṁgraha, lepas* are of ten types :

1. Snaihika

2. Nirvāpana

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3. *Prasādana*
4. *Stambana*
5. *Vilayana*
6. *Pācana*
7. *Pīḍana*
8. *Śodhana*
9. *Śoṣana*
10. *Savarnī Karaṇa*

Among these, first five *lepas* are most useful formulations for the treatment of *Vraṇa Śotha*. Rest of the five *lepas* are useful for the treatment of secondary stage of *Vraṇa*.

Ācārya Śārṅgadhara concept regarding *lepa kalpanā* : on the basis of the drugs used for the preparation of *lepa kalpanā* and their action *Ācārya Śāraṅgadhara* has classified *lepa kalpanā* like wise :

दोषघ्नो विषहा वर्ण्यो मुखलेपस्त्रिधा मत: । (शा० सं० उ० ख० ११.१)

Lepakalpanā is of three varieties, viz :

1. Doṣaghnalepa (anti-*doṣic*)
2. Viṣaghnalepa (anti-poisonous)
3. Varnya mukha lepa (cosmetic application over the face to improve colour and complexion)

Doṣaghnalepa

पुनर्नवां दारु शुण्ठीं सिद्धार्थं शिग्रुमेव च । पिष्ट्वा चैवारनालेन प्रलेप: सर्वशोथजित् ।।

(शा. सं. उ. ख. ११/३)

Punarnavā, *dāru*, *śuṇṭhī*, *Siddhārtha* and *Śigru* made in to a paste form with ricewash and applied, relieves all kinds of *Śotha* (oedema).

Viṣaghnalepa

अजादुग्धतिलैर्लेपो नवनीतेन संयुत: । शोथमारुष्करं हन्ति लेपो वा कृष्णमृत्तिकै: ।।

(शा. सं. उ. ख. ११/७)

Paste of *tilā* with goat's milk and butter or a paste of black clay will be effective against oedema caused by contact of *Bhallātaka*.

लाङ्गल्यतिविषालाबुजालिनीमूलबीजकै: । लेपो धान्याम्बुसंपिष्ट: कीटविस्फोटनाशन: ।।

(शा. सं. उ. ख. ११/८)

Lāṅgalī, *ativiṣa*, *alābu*, *jālinī* and seeds of *mūlaka* made into a paste with sour gruel is effective against insect stings.

Varṇyalepa

रक्तचन्दनमञ्जिष्ठालोध्रकुष्ठप्रियङ्गव: । वटाङ्कुरा मसूराश्च व्यङ्गघ्ना मुखकान्तिदा: ।।

(शा. सं. उ. ख. ११/९)

Rakta candana, *mañjiṣṭha*, *lodhra*, *kuṣṭha*, *priyāṅgu*, *vaṭāṅkura* and *masūra* is a good application for *vyaṅga* (pigmented patch over the face, acne) and confers fair complexion to the face.

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मातुलुङ्गजटा सर्पिः शिला गोशकृतो रसः । मुखकान्तिकरो लेपः पिटिकाव्यङ्गकालजित् ।।

(शा. सं. उ. ख. ११/१०)

Root of *Mātuluṅga*, ghee, *manahśila*, rubbed with juice of cowdung applied to the face removes pimples, black spots and patches.

Ācārya Suśruta has advised incorporating of *Sneha dravya* in *lepa* formulation according to *doṣas:*

षड्भागं पैत्तिके स्नेहं चतुर्भागन्तु वातिके । अष्टभागन्तु कफजे स्नेहमात्रां प्रदापयेत् ।। (सु. सु. १८/१०)

Doṣa	*Sneha dravya quantity*
1. *Vātaja Vyādhi*	1/4th part
2. *Pittaja Vyādhi*	1/6th part
3. *Kaphaja Vyādhi*	1/8th part

Technique of lepa application

तत्रा प्रतिलोममालिम्पेन्नानुलोमम् । प्रतिलोमे हि सम्यगौषधमवतिष्ठतेऽनुप्रविशति रोमकूपान् स्वेदवाहिभिश्च सिरामुखैवीर्यं प्राप्नोति । (सु. सु. १८/४)

Lepa applications should be gently rubbed in an upward *(pratiloma)* or reverse direction as of the hairs over the skin to make the action of the application quick and effective. Because of this application enters in to *romakūpa* and further get absorbed through *swedāvāhasrotas* and *Siramukha*, then produces good rusults.

Thickness of the *lepas* while application mentioned by *Ācārya Śāraṅgadhara.*

त्रिप्रमाणश्चतुर्भागत्रिभागाऽर्धाङ्गुलोन्नतः । (शा. सं. उ. ख. ११/२)

One fourth, one third and half *aṅgulīs* is the thickness of the paste respectively for *doṣaghna. Viṣaghna* and *Varṇya lepas.*

On the basis of nature of *lepa* and its thickness etc. *Ācārya Śārṅgadhara* has again classified *lepakalpanā* like wise.

द्वौ तस्य कथितौ भेदौ प्रलेपाख्यप्रदेहकौ । (शा. सं. उ. ख. ११/७१)

Lepa is of two kinds,viz. *Pralepa* and *Pradeha.*

शीतस्तनुर्विशोषी च प्रलेपः परिकीर्तितः । आर्द्रो घनस्तथोष्णः स्यात्प्रदेहः श्लेष्मवातहा ।।

(शा. सं. उ. ख. ११/७२-७३)

Pralepa is that which is applied cold, thin and which dries quickly, where as *Pradeha* is applied warm, thick and remains moist for a long time.

चमार्द्रं माहिषं यद्वत्प्रोन्नतं सा मितिस्तयोः । (शा. सं. उ. ख. ११/७२)

The thickness of the *Pralepa* and *Pradeha* applications on the skin should be equal to the thickness of a buffalo's skin.

Time of lepa application

न रात्रौ लेपनं कुर्याच्छुष्यमाणं न धारयेत् । शुष्यमाणमुपेक्षेत प्रदेहं पीडनं प्रति ।।

(शा. सं. उ. ख. ११/७४-७५)

Pralepa should not be applied at nights nor it should be allowed to stay on after it dries up, where

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as *Pradehas* can be allowed to stay on (even after drying) in order to cause constriction or pressure over the part of the body.

तमसा पिहितो ह्यूष्मा रोमकूपमुखे स्थितः। विना लेपेन निर्याति रात्रौनो लेपयेदतः।।

(शा. सं. उ. ख. ११/७५-७६)

The heat of the body comes out through the skin pores at nights normally, if medicinal applications are done at nights the skin pores get blocked and obstruct the transfer of body heat. So external applications should not be done at nights.

रात्रावपि प्रलेपादिविधिः कार्यो विचक्षणैः। अपक्वशोथे गम्भीरे रक्तश्लेष्मसमुद्भवे।।

(शा. सं. उ. ख. ११/७६-७७)

But in cases of *apakva śotha, gambhira śotha* and *śotha* arising form *rakta* and *sleṣmā*, applications can be made even at nights.

Specifications to be followed while application of lepa

आर्द्रो व्याधिहरः स स्याच्छुष्को दूषयति च्छविम्। (शा. सं. उ. ख. ११/२)

(1) *Lepas* are effective so long as they are moist and once they dry up they will harm the skin.

न च शुष्यमाणमुपेक्षेप अन्यत्रा पीडयितत्वात् शुष्को ह्यपार्थको रूक्करश्च। (सु. सू. १८/५)

न च पर्युषितं लेपं कदाचिदवचारयेत्। उपर्युपरि लेपं तु न कदाचित् प्रदापयेत्।।

ऊष्माणं वेदनां दाहं धनत्वाज्जनयेत् स हि।। (सु. सू. १८/१४)

न च तेनैव लेपेन प्रदेहं दापयेत् पुनः। शुष्कभावात् स निर्वीर्यो युक्तोऽपि स्यादपार्थकः।। (सु. सू. १८/१७)

Preservation of lepa : Vegetable *lepa cūrṇa* will preserve their potency for 30 days if kept in airtight containers. Mineral and metallic preparations last indefinitely.

Daśāṅga lepa

शिरीषं मधुयष्टी च तगरं रक्तचन्दनम्। एला मांसी निषायुग्मं कुष्ठं वालकमेव च।।

इति संचूर्ण्य लोपोऽयं पञ्चमांशघृतप्लुतः।।

जलेन क्रियते सुज्ञैर्दशाङ्ग इति संज्ञितः। विसर्पान्विषविस्फोटाञ्शोथान्दुष्टव्रणाञ्जयेत्।

(शा. सं. उ. ख. ११/५-६)

Śirīṣa, madhuyaṣṭi, tagara, raktacandana, elā, *māṃsi,* the two *niśās, kuṣṭha* and *vālaka* made in to paste with water and one fifth part of ghee added and applied over the skin. This recipe known as *Daśāṅga lepa* is effective in *visarpa, viṣa, visphoṭa, śotha* and *duṣṭa vraṇa.*

Some of the examples of lepa preparation

Formulation	*Reference*
1. *Daśāṅga lepa*	*Śārṅgadhara- Saṁhitā, Uttara Khanda-11.5-6*
	Bhaiṣajyaratnāvalī, Visarpādhikāra - 16
2. *Avalgujādilepa*	*Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya-20.13*
3. *Kaccūrādi cūrṇa (Kaccūrādi lepa)-*	*Sahasrayoga, Cūrṇaprakaraṇa - 62*
4. *Kālaka cūrṇa lepa (Kālaka lepa)*	*Aṣṭāṅgahṛdaya, Uttarasthāna, Adhyāya- 22.99*

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5. Gṛhadhūmādi lepa	*Aṣṭāṅgahṛdaya, Cikitsāsthāna, Adhyāya-22.36*
6. Tutthādi lepa	*Bhārata Bhaiṣajyaratnākara, Lepaprakaraṇa -2509*
7. Pathyādi lepa	*Yogaratnākara, Kuṣṭhādhikāra, P.No. - 682*
8. Rāsnādi cūrṇa (Rāsnādi lepa)	*Sahasrayoga, Cūrṇaprakaraṇa - 61*
9. Rasottamādi lepa cūrṇa	*Vaidyajivanam, vilāsa 4.16*
10. Śothaghna lepa (Doṣaghna lepa)	*Śārṅgadharasaṁhitā ,Uttarakhaṇḍa, Adhyāya 11.3*
11. Sarṣapādi pralepa	*Bhaiṣajyaratnāvalī, Galagaṇḍādirogādhikāra-7*
12. Sindūrādi lepa	*Pharmacopoeia of Hospital of Indian Medicine, Madras, page - 110*
13.Tarunyapitikāp lepa	*Śārṅgadhara Saṁhitā, Uttarakhaṇḍa, Adhyāya- 11.11*

Śatadhauta Ghṛta and Sahasradhauta Ghṛta

शतधौतघृतम् क्ली। यत् पुनः पुनः सन्ताप्य शीताम्भसा निर्वाप्यते तथाविध सर्पिषि।
शतं वारान् शीततोयेन धौतं फेनितं घृतम् इति ईशानदेवः।।
तद् गुणाः वातपित्तदाहक्षतनाशित्वम्।। (वैद्यक शब्दसिन्धु)
अथवा शतधौतेन सर्पिषा क्षीरजेन वा। (शा. सं. उ. ख. १३/४४)

It is a process meant for enhancement of the qualities of *ghṛta*, which is used for external applications. By doing *śatadhauta* and *śahasradhauta ghṛta* process, *ghṛta* become more *mṛdutva* and *ghṛtamālinya* (residual of ghee) will get removed. *Ghṛta* is washed *(dhauta)* with cold water . This medicine is advised to prepare in cold season.

Procedure

Required quantity of *goghṛta* is collected in a *kāmsya pātra* and two times of cold water is added and is rubbed with hands for many times. Then water has to be separated and removed. Over the remained *ghṛta* again cold water is added and same process is continued. If this process is done for 100 times, then it is called *śatadhauta ghṛta* and if the same process is continued for 1000 times, then obtained *ghṛta* is called *sahasradhauta ghṛta*. Here *kāṁsya pātra* is selectively chosen because, *kāṁsya dhātu* is having *twak hitakara* and *viṣaghna* properties hence, while preparing the *śatadhauta* and *sahasradhauta ghṛtas*, the qualities of *kāṁsya pātra* will be attributed to *ghṛta Sahasradhāuta ghṛta* is considered more efficacious than *śatadhauta ghṛta*.

Characters

Ghṛta will get butter like white colour and it will posses more *śīta guṇa*.

Uses

It is used as external application for the treatment of *dāha, dagdhavedana, masūrika, vraṇa, visarpa, angasphoṭa, kuṣṭa* etc.

Ācārya Śāraṅgadhara advised that usage of *śatadhauta ghṛta* for the purpose of *akṣi tarpaṇa*.

Both *śatadhauta* and *sahasra dhauta ghṛta's* are used as base for the preparation of *malahara kalpanā*.

Malahara Kalpanā (maraham)

The words *maraham* and *malaham* are basically originated from unani system of medicine,

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Yogaratnākara mentioned this, by the name of *malahara kalpanā*. This is called *malahara kalpanā* because it removes *mala* (residue etc.) from *vraṇa*, *viḍhradi*, *tvakvikāra* etc. conditions. This is similar to ointments in modern pharmaceutics.

Among *guggulu, rāla (sarjarasa), sikta (madhuciṣṭa-* beeswax), *tila taila, sikta taila,* menthol, thaimol, *śatadhauta ghṛta*, *sahasra dhauta ghṛta, gandha phiroja* etc. any one or more than one are to be taken as a base and fine powder form of *kajjali, śodhita pārada, śodhita gandhaka, śindhūra, karpūra, tuttha, mṛddāraśṛnga, spaṭika, tankaṇa, yasada puṣpa* etc. medicinal drugs are mixed uniformely in above mentioned base.

Method of preparation

Tila taila, siktha, gandha phiroja etc. are taken in prescribed quantity. In a clean stainless steel vessel first *taila* is heated over *mandāgni*, then *siktha, gandhaphiroja* etc. are added and mixed well, when these base are get liquified then contents are filtered with cloth and *tuttha, tankaṇa bhasma, sphaṭikabhasma* etc. medicinal drugs in prescribed quantity are added little by little, stirring while with ladle and then again filtered with cloth, then obtained product is called *malahara kalpanā*. This is preserved in well packed glass or plastic containers or collapsible tubes.

Uses

These *malaharas* are mainly used for *vraṇa śodhana* and *vraṇaropana* purpose and also these are used for the treatment of *vidhradhi, arśa. Śirahsula,tvaka vikāra, kaṭiśūla* etc.

Method 2 : Malahara kalpanā also can be prepared by trituration method with the help of ointment slab and spatula by following manner. In this method medicinal drugs and little quantity of base is added. Trituration is continued till they get mixed uniformly.

E.g. : *Sarjarasamalahara, Gandhakamalahara, Kālamarham, Swetamalahara etc.*

Sarjarasamalahara (Rala Malahara)

(रसतन्त्रसार व सिद्धप्रयोग संग्रह प्रथम पृ० सं० ८४९)

Apparaturs required

Vessel, ladle, *khalvayantra*, cloth, *lohapātra*.

Drugs required

Tila taila	:	16 parts
Sarjarasa (Rāla)	:	4 parts
Tuttha (asuddha)	:	1 part
Spaṭika	:	1 part

Procedure

Tilataila is heated in a *loha pātra*, when *phena* (foam is produced in *tilataila*, then *lohapātra* is taken out from fire and fine powder of *rāla, tuttha, spaṭika* are added little by little and mixed well, when all the three drugs are get mixed properly in *taila*, then this *taila* filtered in to another vessel with the help of cloth. When contents becomes cold little by little water is added and contents are rubbed with hands, while doing so water is frequently changed. Like that 15 to 20 times water is changed and rubbed with hands for many times, by doing so, mixture of *taila* and *rāla* etc. bulges and yellowish

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white colour *malahara kalpanā* is produced. From the starting onwords, slowly *tutha* dissolves in water and get separated little by little by changing water. It can be observed by green colour of water. When water does not turns to green colour that indicates, *malahara* is produced. This is called *sarjarasa malahara*. This *malahara* is preserved in clean glass jar, at the bottom and above part of the jar is filled by fresh water and this water has to be changed daily.

This *sarjarasamalahara* is economically cheap and more useful.

Āmayika prayoga : *Agnidagdha vraṇa*, *dāha*, *gudapāka* in childrens, *arśa* etc.

This can be applied directely over lesion or after applying over a thin clean cloth and that cloth is pasted over the lesion also practiced.

Preservation

If water is not changed frequently and after many days this *malahara* get spoiled.

Sikthataila

Intrtoduction

A combination of *siktha* and *taila* is called *siktha taila* and it is used as a base for different *malahara kalpanās*.

भागैकं विमलं सिक्थं तैलन्तु रसभागिकम। आदाय वङ्गलिप्तायां स्थालिकायां निधापयेत।।
पचेत्तावन्मन्दवन्हौ यावत् सिक्थं द्रवीभवेत्। स्थालिकामथ यत्नेन धरण्यामवतारयेत्।।
तावत्प्रचालयेद्दर्व्या यावदेति प्रगाढताम्। सिक्थतैलसमायोगात् सिक्थतैलमिदं स्मृतम्।।

(र. त. ४/५९-६१)

Method No.-1

Apparatus required

Tin coated iron vessel, laddle etc.

Drugs required

Siktha (Madhūciṣṭa) : *1 part*

Tila taila : *8 parts*

Procedure

One part of *Siktha* (beeswax) and 8 parts of *tilataila* taken in tincoated iron vessel and heated over *mandāgni*. When bees wax completely mixed in *tilataila*, vessel is taken out from fire then also stirring is continued with the help of ladle. When it becomes concenterated form then it is preserved in wide mouthed glass cantainer. This is prepared by combination of *siktha* and *taila*, hence it is called *sikthataila*.

Method No.2

भागैकंविमलं सिक्थं तैलन्तु शरभागिकम्। पूर्वोद्दिष्टविधानेन पचेद्रसविशारदः।।
जायते नवनीताभं यामं दर्व्या प्रचालितम्। रसज्ञैः कीर्तितामिदं सिक्थतैलं द्वितीयकम्।।

(र. त. ४/६२-६३)

Drugs required

Siktha : *1 part*

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Tilataila : *5 parts*

Procedure

One part of *siktha* and five parts of *tilataila* are taken in tin coated iron vessel and heated over *mandāgni* till completely bees wax get mixed in *tilataila*, vessel is taken out then also mixing with ladle is continued for 3 hours. Substance becomes like *navanītha* (butter) then it is collected in to glass container and preserved, This is called *dwitiya sikthataila*.

Uses of Siktha taila

आद्यं तु शीतसमये ग्रीष्मर्तौ तु द्वितीयकम् । सिक्थतैलं मलहरप्रयोगेषु नियोजयेत् ।। (र. त. ४/६४)

Sikthataila which is produced by first method (1:8) is used as a base to prepare the *malahara Kalpanās*, which are prepared in *Sītartu*. Where as Skthataila which is produced by second method(1:5) is used as a base to prepare the *malahara Kalpanās*, Which are prepared in *ghrīṣmaṛtu*.

Gandhakādya malahara

सिक्थतैलं सुविमलं रसतोलकसम्मितम् । गन्धकं गिरिसिन्दूरं तोलकार्धमितं पृथक् ।।
टङ्कणं घनसारं च पृथग् माषद्वयोन्मितम् । दत्त्वा सम्मेल्य यत्नेन काचकुप्यां निधापयेत् ।।
मतो मलहरोऽयं तु गन्धकाद्यसमाह्वयः । विनाशयत्याशु भृशं पामामत्यर्थदारुणम् ।
(रसतरं ८/६५)

सिक्थकं तिलतैलं च युक्तमानविमिश्रितम् । विपक्वं नवनीताभं सिक्थतैलं प्रकीर्तितम् ।।
(रसतरं २/३४)

Apparatus required

Vessel, stirrer, cloth, *khalva yantra* etc.

Drugs required

Sikṭha taila	:	70 gm
Āmalasāra gandhaka	:	6 gm
Sindūra	:	6 gm
Tankaṇa	:	2 gm
Karpūra	:	2 gm.

Procedure

Gandhaka, sindūra, tankaṇa, karpūra these four drugs are collected in a *khalvayantra* and grinded well, then *sikṭha taila* is added and grinded well for half an hour. Then obtained product is called *gandhaka malahara* and it is preserved in glass container.

Āmayika prayoga

It is used for external application only. *Pāma, dadru, kaṇḍu, vraṇa.*

If only *gandhaka* and *sikṭha taila* are prepared into *malahara* form by following above mentioned same method of preparation, then it is called *gandhaka malahara*.

Atasyādi upanaha

अतसी-यव-गोधूमचूर्णमालोडितं द्रवैः । सम्पक्वं सौषधस्नेहं वस्त्रोणान्तरितं तथा ।।

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बध्यते व्रणशोथादावुपनाहः स उच्यते ।। (द्र. ग. वि. आ. यादवजी)

Apparatus required

Stainless steel vessel, stirrer.

Drugs required

Atasī bīja cūrṇa	:	*20 gms*
Yava cūrṇa	:	*20 gms*
Haridra curna	:	*10 gms*
Daśāngalepa cūrṇa	:	*10 gms*
Gomūtra or Kānji	:	*150 gms*
Tila taila	:	*10 ml.*
Ghṛta	:	*10 gms*

Procedure

Above mentioned all the drugs are collected in a stainless steel vessel and mixed well with hands. After that, these mixed contents are cooked with *mandāgni* and while cooking contents are mixed with the help of stirrer. When contents becomes into semi liquid consistency, then vessel is taken out from fire and these contents are applied over thick clean cloth (in thick layer form of *lepa*) with the help of spoon, then this cloth should be pasted over the required body surface area(e.g. *vraṇa śotha*) and again it is covered with another cloth like bandage.

This *upanāha* is sticky in nature and it will get easily pasted over the cloth. According to the number of of *vranas*, surface area etc. that much wider cloth is collected and *upanāha auṣadha* is applied and during hot state only it should be pasted over the required surface area of body e.g. *Vraṇa*, *śotha* etc.

It should be applied twice or thrice in a day.

Āmayika Prayoga

Vraṇa, śotha etc.

Dhūpana Kalpanā

Micro organisms, pain, foul smell etc. produced in vrana are treated by *dhūpana* (medicinal fumigation) and called *vraṇa dhūpana*. Same manner *dhūpana* is performed in yoni, guda karna, nasa etc. Places *(yonidhūpana, gudadhūpana, karnadhūpana, nāsadhūpa vraṇadhūpana, gṛhadhūpana* etc.).

Dosage Forms Meant For External Application

Ointments, Creams, Pastes and Jelliese.

Ointments

Ointments are the soft semisolid preparations meant for external application to the skin or mucous membrane. They usually contain a medicament or medicaments dissolved, suspended or emulsified in the base. Ointments are used for their emollient and protective action to the skin. They may also be used as vehicles or bases for the topical application of medicinal substances.

The absorption of medicaments by the tissues from the ointments or other semisolid preparations applied to the skin depends upon a number of factors e.g. properties of the bases used in the formula-

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tion, condition of the patient's skin, site of application, duration of application and degree of friction used in the application.

Creams

Creams are thought of as ointments but usually contain a water-soluble base due to which they can be easily removed from the skin. They are of a softer consistency and have a lighter body than true ointments. When applied to the skin, leave no visible evidence of their presence on the skin.

Pastes

Pastes are the semisolid preparations meant for external application to the skin. They differ from ointments that they generally contain a large amount of finely powdered solids such as starch, zinc oxide, calcium carbonate etc. Due to the presence of these substances they usually become quite thick and stiff than the ointments but are less greasy than ointments.

Since pastes are stiff they do not melt at ordinary temperature thus forming and holding a protective coating over the areas to which they applied. They are not removed for quite a long time. The pastes are not suitable for application to the hair because they are very difficult to remove from there.

Jellies

Jellies are thin transparent or translucent, non-greasy preparations meant for external application to the skin. They are similar to mucilages because they are prepared by using gums but they differ from mucilages in having jelly like consistency. They are used chiefly on mucous membranes for their lubricating. Vaginal jellies and contraceptive jellies are also commonly used.

Since jellies contain carbohydrates and lot of water as base therefore they are prone to microbial growth so they must be suitably preserved. The commonly used jelling agents for the preparation of jellies are – tragacanth, sodium alginate, starch, pectin, gelatin, methylcellulose, carbomer, polyvinyl alcohols etc.

Characteristics of an Ideal ointment

1. It should be chemically and physically stable.
2. It should be smooth and free from grittyness.
3. It should melt or soften at body temperature and be easily applied.
4. The base should be non-irritating and should have no therapeutic action.
5. The medicament should be finely divided and uniformly distributed throughout the base.

Ointment bases

The ointment base is that substance or part of an ointment which serves as a carrier or vehicle for the medicament. An ideal ointment base should be inert, stable, smooth, compatible with the skin, non-irritating and should releae the incorporated medicament readily.

Since there is no single ointment base abailable, which possesses all these qualities, therefore it becomes necessary to use more than one ointment base in the preparation of ointments.

Classification of Ointment Bases

The ointment bases are classified as follows:

1. Oleaginous bases
2. Absorption bases,

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3. Emulsion bases,
4. Water soluble bases.

1.Oleaginous bases

Hydrocarbon bases

i. Petrolatum(Soft Paraffin)
ii. Hard paraffin
iii. Liquid paraffin

2- Absorption Bases

i. Wool Fat
ii. Hydrous Wool Fat
iii. Wool Alcohol
iv. Bees Wax
v. Cholesterol

Emulsion Bases

Emulsion bases are semisolid emulsions having cream like consistency. These are of two types; oil in water or water in oil emulsions.

Factors Governing Selection of an Ideal Ointment Base

1. Dermatological factors
2. Pharmaceutical factors

Preparation of Ointments

There are two methods of preparation of ointments for extemporaneous compounding;

1.Trituration Method,
2.Fusion Method.

Trituration Method

It is the most commonly and widely used method for the extemporaneous preparation of ointments. The medicament which are to be incorporated in the base are generally insoluble in it, therefore it becomes necessary to reduce the medicament to fine powder otherwise the distribution of the medicment into the base will not be uniform.

In order to obtain the best results the medicament(s) is triturated with a small amount of the base on an ointment slab with the help of a stainless steel spatula with long broad blade. To this the additional quantities of the base are incorporated and triturated until the medicament(s) is homogenously mixed with the base.

Fusion Method

When an ointment base contains a number of solid ingredients such as white bees wax, cetyl alcohol, stearyl alcohol, stearic acid, hard paraffin etc, as components of the base; it is necessary to melt them. The melting of the substances should be done in the decreasing order of their melting points i.e. the substance with highest melting point should be melted first, then the substance with next melting point and so on. This will avoid the over heating of substances having low melting points. The medica-

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ment is then added slowly in the melted ingredients and stirred thoroughly until the mass cools down and a homogenous product is formed.

Jellies

For the preparation of jellies a whole gum is prefered than the powdered gum because the former gives a clear preparation of uniform consistency. Acacia, tragacanth, gelatin, carboxymethyl cellulose or similar substances may be used for the preparation of jellies. Since jellies are prone to bacterial and mold growth, they must contain a suitable preservative. A suitable flavouring agent can also be incorporated to give a desirable odour to the preparation.

Poulitices or cataplasms

Poultices are the viscous wet masses of solid substances applied to the skin for their fomentation action in order to give relief from pain or reduce inflammation or in some cases to act as counter irritant. Generally they are prepared by using clays such as heavy kaolin. Glycerin is also incorporated because of its hygroscopic nature.They are applied while hot by spreading thickly upon cloth or any other suitable packing material.

Packing

The ointments are generally packed in ointment jars or collapsible tubes.

Liquids for external use

Liquids to be applied to the skin e.g. liniments, lotions etc.

Liniments

Liniments are liquid or semiliquid preparations meant for external application to the skin. They contain substances possessing analgesic, rubefacient soothing or stimulating properties. Liniments are usually applied to the skin with friction and rubbing of the skin. They should not be applied to the broken skin. Liniments should be dispensed in coloured flutted bottles in order to distinguish from preparations meant for internal use.

The bottle should be labelled "For external use only"

Lotions

Lotions are usually liquid suspensions or dispersions intended for external application to the skin. They are applied directly to the skin without rubbing with the help of some absorbent material such as cotton wool or guaze soaked in the lotion is applied to the affected part. Lotions may be employed for local cooling,soothing or protective purposes. Dermatologists frequently prescribe lotions for anaesthetic or antiseptic actions. The inclusion of alclohol in a lotion hastens its drying and produces cooling effect whereas the addition of glycerin in a lotion keeps the skin moist for sufficient long time and does not allow the preparation to dry.

Bacterials and molds grow in certain lotions if no preservative is added to the preparation. Even if a preservative is added care must be taken to avoid contamination during preparation of the lotion.

Lotions should be dispensed in coloured flutted bottles in order to distinguish from preparations meant for intermal use. The container should be labelled. "for external use only" on long standing the lotions have a tendency to separate out therefore the container must be labelled "Shake before use".

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Chapter 23

NETRA KALPNĀ

(Pharmaceutical Procedures and formulations related to eye)

Scholars of *Āyurveda* have mentioned , different number of *netra kalpā* according to their pharmacological actions as mentioned below.

तर्पणं पुटापाकश्च सेक आश्च्योतनाञ्जने । तत्र तत्रोपदिष्टानि तेषां व्याषं निबोध मे ।। (सु. उ. १८/४)

सेकं आश्चोतनं पिण्डी विडालस्तर्पणं तथा। पुटपाकोऽञ्जनं चैभिः कल्पैर्नेत्रमुपाचरेत् ।। (शा. उ. १३/१)

Netra Kalpa

According to Ācarya Suśruta 5 types	*According to Ācarya Śaraṅgadhara 7 types*
1. Tarpana	*1. Seka*
2. Puṭapāka	*2. Āscyotana*
3. Seka	*3. Piṇḍī*
4. Āscyotana	*4. Biḍāla*
5. Añjana	*5. Tarpaṇa*
	6. Puṭapāka
	7. Añjana

Seven types of *netra kalpā* metioned by *Ācarya Śaraṅgadhara* are elaborated here under.

Seka

सेकस्तु सूक्ष्मधाराभिः सर्वस्मिन्नयने हितः। मीलिताक्षस्य मर्त्यस्य प्रदेयश्चतुरङ्गुलात्।।
स चापि स्नेहनो वाते रक्ते पित्ते च रोपणः। लेखनश्च कफे कार्यस्तस्य मात्राऽधुनोच्यते ।।
षड्वाक्शतैः स्नेहनेषु चतुर्भिश्चैव रोपणे। वाक्शतैश्च त्रिभिः कार्यः सेको लेखनकर्मणि ।।
कार्यस्तु दिवसे सेको रात्रौ चात्ययिके गदे। (शा. उ. २/५)

Seka is pouring in thin streams of any liquid over the closed eye from a height of about four *angulīs*. In disorders of *vāta*, *snehana seka* is done, in disorders of *rakta* or *pitta* a *ropaṇa seka* and in disorders of *kapha* a *lekhana seka,* their duration will be described. *Snehana seka* is done for a duration of 600 *Mātrā kālas* a *ropana* for 400 *Mātrā kālas*, and *lekhana* for 300 *Mātra kālas* (Duration of time required to pronounce a syllable is called as *Mātra*. Ten, six and five minutes respectively is the duration for 600 , 400 and 300 *mātra kalas* approximately).

Seka should be done during day and only in emergency even at nights.

Different Sekayogas Mentioned by Ācārya Śārṅgadhara

अथ त्रिविधाक्षिस्वेदानां प्रयोगद्वारेण कर्म दर्शयन्नाह-एरण्डत्वक्पत्रमूलैः शृतमाजं पयो हितम् ।।
सुखोष्णं सेचनं नेत्रे वाताभिष्यन्दनाशनम् । (शा.उ. ५-६)

Goats milk boiled with leaves, roots and bark of eraṇḍa, filtered and used in luke warm state as a seka cures *vātaja abhiṣyanda.*

परिषेको हितो नेत्रे पयः कोष्णं ससैन्धवम् ।। रजनीदारुसिद्धं वा सैन्धवेन समन्वितम् ।

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वाताभिष्यन्दशमनं हितं मारुतपर्यये । शुष्काक्षिपाके च हितमिदं सेचनकं सदा ।

(शा. उ. ६-८)

Pariṣeka with warm milk mixed with *saindhava* or with *rajanī*, *dāru* and *saindhava* is effective in *vātābhiṣyanda*, *maruta paryaya* and *śuṣkākṣi pāka*.

साबरं मधुकं तुल्यं घृतभृष्टं सुचूर्णितम् । छागक्षीरे घृतं सेकात्पित्तरक्तभिघातजित् । (शा. उ. ८-९)

Equal quantities of *sābara, madhuka* are powdered and fried well with a little quantity of ghee, boiled in goats milk. *Pariṣeka* with this milk is beneficial in *pittābhiṣyanda* and *abhighāta*.

त्रिफलालोध्रयष्टीभिः शर्कराभद्रमुस्तकैः ।। पिष्टैः शीताम्बुना सेको रक्ताभिष्यान्दनाशनः । (शा. उ. ९-१०)

Triphalā, lodhra, yaṣṭī śarkarā and *bhadramusta* are macerated well with cold water and filtered. This water applied cold to the eyes is effective in *raktābhiṣyanda*.

लाक्षमधुकमञ्जिष्ठालोध्रकालानुसारिवाः ।। पुण्डरीकयुतः सेको रक्ताभिष्यन्दनाशनः । (शा. उ. १०-११)

Lākṣā, madhuka, mañjiṣṭā, lodhra, kālānusāriva and *puṇḍarīka* are macerated with cold water and filtered. This water used for *seka* cures *raktābhiṣyanda*.

श्वेतलोध्रं घृते भृष्टं चूर्णितं पटविस्रुतम् ।। उष्णाम्बुना विमृदितं सेकाच्छूलघ्नमम्बके ।। (शा. उ. ११-१२)

Svetalodhra is powdered well and fried in ghee, mixed with warm water and used as a *śeka* relieves pain in the eyes.

Aścyotana

अथाश्च्योतनकं कार्यं निशायां न कथंचन ।। उन्मीलितेऽक्षिण दृङ्मध्ये बिन्दुभिर्व्यङ्गुलद्विघतम् ।

(शा. उ. १२-१३)

Aścyotana is also to be done in day time only but not at nights, with the eye open, with drops of medicine being in stilled from a height of about two *aṅgulis*.

बिन्दवोऽष्टौलेखनेषु स्नेहने दश बिन्दवः ।। रोपणे द्वादश प्रोक्तास्ते शीते कोष्णरूपिणः।
उष्णे च शीतरूपाः स्युः सर्वत्रैवैष निश्चयः ।। (शा. उ. १३-१४)

Eight drops for *lekhana* action, ten drops for *snehana* and twelve drops for *ropaṇa* are the indicated doses.The medicine should be made warm during cold season and cold during hot season. This rule applies always.

वाते तिक्तं तथा स्निग्धं पित्ते मधुरशीतलम् । तिक्तोष्णरूक्षं च कफे क्रमादाश्च्योतनं हितम् ।।

(शा. उ. १३/१५)

In disorders of *vāta*; the medicine should be bitter and oily, in *pitta* disorders it should be sweet and cold, and in *kapha* disorders bitter, warm and dry.

आश्च्योतनानां सर्वेषां मात्रा स्याद्वाक्शतं हिता । निमेषोन्मेषणं पुंसामङ्गुल्योश्छोटिकाऽथवा ।।
गुर्वक्षरोच्चारणं वा वाङ्मात्रेयं स्मृता बुधैः । (शा. उ. १३/१६-१७)

Aścyotana is to be retained for a period of one hundred syllables, the time required for one winking of the eye lids, the hand going round the knee one or uttering a long consonent is the unit called as one *vākmātrā*.

Aścyotana Yoga

बिल्वादिपञ्चमूलेन बृहत्येरण्डशिग्रुभिः ।। क्वाथ अश्च्योतने कोष्णो वाताभिष्यन्दनाशनः । (शा. उ. १७-१८)

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Decoction of *pañcamūlas* starting with bilva (*bilva, agnimantha, syonāka, kāsmarī* and *pāṭalā*) *bṛhatī, eraṇḍa* and *śigru* instilled warm into the eye cures *vāta- abhiṣyanda.*

अम्बुपिष्टैर्निम्बपत्रैस्त्वचं लोध्रस्य लेपयेत् ।। प्रताप्य वह्निना पिष्ट्वा तद्रसो नेत्रपूरणात् ।
वातोत्थं रक्तपित्तोत्थमभिष्यन्दं विनाशयेत् ।। (शा. उ. १३/१८-१९)

A piece of *lodhra bark* is covered with a paste of leaves of *nimba* made in water. After it dries up slightly, the bark is warmed on fire and juice extracted by pressing it. This juice put into the eyes is effective in curing *abhiṣyanda* (ophthalmia) arising from *vāta, rakta* or *pitta.*

त्रिफलाश्च्योतनं नेत्रे सर्वाभिष्यन्दनाशनम् । स्त्रीस्तन्याश्च्योतनं नेत्रे रक्तपित्तानिलार्तिजित् ।।
क्षीरसर्पिर्घृतं वापि वातरक्तरुजं जयेत् । (शा. उ. २०-२१)

Aścyotana with *triphalā kwatha* cures all varieties of *abhiṣyanda.*

Aścyotana with breast milk relieves *raktapitta* and pain due to vata, likewise is the action of ghee prepared by churning milk in relieving eye pain of *vāta* and *rakta.*

Piṇḍi(kavalikā)

पिण्डी कवलिका प्रोक्ता बध्यते पट्टवस्त्रकैः ।। नेत्राभिष्यन्दयोग्या सा व्रणेष्वपि निबध्यते । (शा. उ. २१-२२)

Piṇḍī also known as *kavalikā* is a poultice over the eye (medicine being tied with cloth) useful in *abhiṣyanda* and *vraṇas* of the eye.

अभिष्यन्देऽधिमन्थे च संजाते श्लैष्मसंभवे ।। स्निग्धस्विन्नोत्तमाङ्गस्य शिरस्तीक्ष्णैर्विरिचयेत् । (शा. उ. २२-२३)

In *abhiṣyanda* and *adimantha* arising from *śleṣmā*, the head is to be anointed with oil, mildly fomented and a powerful *śiro-virecana* is administered.

अधिमन्थेषु सर्वेषु ललाटे व्यधयेत्सिराम् ।। अशान्ते सर्वथा मन्थे भ्रुवोरुपरि दाहयेत् । (शा. उ. २३-२४)

In all types of *adhimantha*, the vein in the forehead is to be cut. If pain does not subside branding with red hot iron should be done above the eye brows.

Piṇḍī (kavalikā) Yoga

अभिष्यन्देषु सर्वेषु बन्धीयात्पिण्डिकां बुधः ।।
वाताभिष्यन्दशान्त्यर्थं स्निग्धोष्णा पिण्डिका भवेत् । एरण्डपत्रमूलत्वङ्निर्मिता वातनाशिनी ।।
(शा. उ. २४-२५)

In all *abhisyandas*, *piṇḍī* is to be tied, in cases of *vāta abhisyanda*, the *piṇḍi* must be oily and warm; leaves , root and bark of *eraṇḍa* made into a *piṇḍī* mitigates *vāta, abhisyanda.*

पित्ताभिष्यन्दनाशाय धात्रीपिण्डी सुखावहा। महानिम्बफलोद्भूता पिण्डी वा पित्तनाशिनी ।।
शिग्रुपत्रकृता पिण्डी श्लेष्माभिष्यन्दनाशिनी। निम्बपत्रकृता पिण्डी श्लेष्मपित्तहरा भवेत् ।।
त्रिफलापिण्डिका प्रोक्ता नाशने श्लेष्मपित्तयोः । पिष्ट्वा काञ्जिकतोयेन घृतभृष्टा च पिण्डिका ।।
(शा. उ. २६-२८)

For *pittābhiṣyanda*, a *piṇḍī* of *dhātrī* or fruits of *mahānimba* is curative.

For *kaphābhiṣyanda a piṇḍī* with leaves of *śigru* is ideal.

Piṇḍī of leaves of *nimba* or *triphalā* is beneficial in cases *abhiṣyanda* due to *śleṣma* and *pitta.*

लोध्रस्य हरति क्षिप्रमभिष्यन्दमसृग्भवम् । शुण्ठीनिम्बदलैः पिण्डी सुखोष्णा स्वल्पसैन्धवा ।।
धार्या चक्षुषि संयोगाच्छोथकण्डूव्यथापहा। (शा. उ. २९-३०)

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A piṇḍi prepard by macerating *lodhra* with *rice-wash* and later fried in ghee quickly relieves *raktābhisyanda*.

A piṇḍī of *śuṇṭhī* and leaves of *nimba* with al little of *saindhava* made warm and tied ovfer the eyes relieves swelling, itching and pain of the eyes.

Biḍālaka

बिडालको बहिर्लेपो नेत्रे पक्ष्मविवर्जितः ।। तस्य मात्रा परिज्ञेया मुखलेपविधानवत् । (शा. उ. ३०-३१)

Biḍālaka is defined as the application of paste over the eye lids, avoiding the area of eye lashes, its procedure is similar to *mukhalepa*.

Lepa for Eye

यष्टीगैरिकसिन्धूत्थदार्वीतार्क्ष्यैः समांशकैः ।। जलपिष्टैर्बहिर्लेपः सर्वनेत्रामयापहः । (शा० उ० ३१-३२)

Paste prepared with *yastī, gairika, saindhava, dārvī*, and *tārksya*- all equal parts macerated nicely with water and applied over the eye lids cures all eye diseases.

रसाञ्जनेन वा लेपः पथ्याविश्वदलैरपि ।। कुमारिकाग्निपत्रैर्वा दाडिमीपल्लवैरपि ।
वचाहरिद्रानिम्बैर्वा तथा नागरगैरिकैः ।। (शा. उ. ३२-३३)

Paste of *rasāñjana; pathya* and leaves of *visva (śuṇthī)*, *kumārī* and leaves of *agni* (*citraka*), tender leaves of *dāḍimā*; *vaca*, *haridrā* and *nimba* or *nāgara* and *gairika* acts similarly.

दग्ध्वा ससैन्धवं लोध्रं मधूच्छिष्टयुते घृते । पिष्टमञ्जनलेपाभ्यां सद्यो नेत्ररुजापहम् ।। (शा. उ. ३४)

Lodhra and *saindhava* are burnt to ashes and mixed with beeswax and honey. This applied over the eye as *biḍālaka* or applied into the eye as *añjana* quickluy relieves pain in the eyes.

लोहस्य पात्रे संघृष्टो रसो निम्बफलोद्भवः। किंचिद्घनो बहिर्लेपान्नेत्रबाधां व्यपोहति ।। (शा. उ. ३५)

Pulp of fruits of *nimba* is kept in an iron vessel and rubeed with a iron morter till the paste becomes thick, this paste applied over the eyes relieves eye pain quickly.

संचूर्ण्य मरिचं केशराजस्वरसमर्दनात् । लेपनादर्मणां नाशं करोत्येष प्रयोगराट् ।। (शा. उ. ३६)

Marica is made into a paste with juice of *keśarāja* (*bhṛngarāja*) and applied into th eyes cures *armas* (*pterygium*). This is a well tried recipe.

स्विन्नां भित्त्वा विनिष्पीड्य भिन्नापञ्जननामिकाम् । शिलैलानतासिन्धूत्थैः सक्षौद्रैः प्रतिसारयेत् ।। (शा. उ. ३७)

Añjananāmikā is given slight fomentation, pricked with a needle, pus and blood removed. Later a paste of *manaśila*, *elā*, *nata*, *saindhava* and honey is applied to the wound for healing.

Akṣitarpaṇa

अथ तर्पणकं वच्मि नेत्रतृप्तिकरं परम् । यद्रुक्षं परिशुष्कं च नेत्रं कुटिलमाविलम् ।।
शीर्णपक्ष्मशिरोत्पातकृच्छ्रोन्मीलनसंयुतम् । तिमिरार्जुनशुक्राद्यैरभिष्यन्दाधिमन्थकैः ।।
शुष्कक्षपाकशोथाभ्यां युक्तं वातविपर्ययैः । तन्नेत्रं तर्पणे योज्यं नेत्ररोगविशारदैः ।।
(शा. उ. ३८-४०)

Now the description is about *trapaṇ*, the method to tone up the eye. It is useful in conditions like dryness, emaciation, dissimilarity, dirtiness, falling of lashes, appearance of redness, difficulty in opening and closing of lids, *timira, arjuna, śukravraṇa, abhiṣyandi, adhimantha, śuṣkākṣipāka, śotha* and *vāta- viparyaya*.

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दुर्दिनात्युष्णशीतेषु चिन्तायासभ्रमेषु च । अशान्तोपदवे चक्षिण तर्पणं न प्रशस्यते ।। (शा. उ. ४१)

Tarpaṇa should not be doen on a cloudy day, very hot or very cold season, when the patient is worried , exhausted and having giddiness or when complications are persisting.

वातातपरजोहीने देशे चोत्तानशायिनः । आधारौ माषचूर्णेन क्लिन्नेन परिमण्डलौ ।।
समौ दृढावसंबाधौ कर्तव्यौ नेत्रकोशयोः । पूरयेद्घृतमण्डेन विलीनेन सुखोदकैः ।।
अथवा शतधौतेन सर्पिषा क्षीरजेन वा । निमग्नान्मक्षिपक्ष्माणि यावत्स्युस्तावदेव हि ।।
पूरयेन्मीलिते नेत्रे तत उन्मीलयेच्छनैः । धारयेद्वर्त्मरोगेषु वाङ्मात्राणां शतं बुधः ।।
स्वच्छे कफे सन्धिरोगे मात्रापञ्चशतं हितम् । शुक्ले च षट्शतं कृष्ण रोगे सप्तशतं मतम् ।।
दृष्टिरोगेष्वटशतमधिमन्थे सहस्रकम् । सहस्रं वातरोगेषु धार्यमेवं हि तर्पणम् ।।
स्विन्नेन यवपिष्टेन स्नेहवीर्येरितं ततः । यथास्वं धूमपानेन कफमस्य विशोधयेत् ।।
एकाहं वा त्र्यहं वापि पञ्चाहं चेष्यते परम् । तर्पणे तृप्तिलिङ्गानि नेत्रेष्वेतानि भावयेत् ।।

(शा० उ० ४२-४९)

The patient is asked to lie comfortably with his face up. A circular wall is built with the paste of *māṣa* flour around the eye. After it dries up slightly, the wall is filled with supernatant fluid of ghee. Ghee washed a hundred times or ghee prepared by churning milk may also be used. The quantity of ghee should be that, which will immerse the lashes when lids are closed. The patient should be asked to open the eyes slowly.

The duration of time of *tarpaṇa* is 100, 500, 600, 700, 800, and 1,000 syllables respectively in diseases of *vartma*, *sandhi śukla kṛṣṇa dṛṣti* and in *adhimantha* and disorders of *vāta*.

After this period, the *ghṛta* is to be removed, face fomented and washed with flour of *yava* and the patient is given a smoke to get over the *kapha* increased by *tarpaṇa*.

Tarpaṇa can be done daily, alternate days or every fifth day as required.

सुखस्वप्नावबोधं च वैशद्यं वर्णपाटवम् । निवृत्तिर्व्याधिशान्तिश्च क्रियालाघवमेव च ।।
अथ साश्रु गुरु स्निग्धं नेत्रं स्यादतितर्पितम् । रूक्षमस्राविलं रुग्णं नेत्रं स्याद्धिनतर्पितम् ।।
रूक्षस्निग्धोपचाराभ्यामेतयोः स्यात्प्रतिक्रिया । (शा. उ. ५०-५२)

Good sleep, easy walking, cleanliness, brightness, relief of distressing symptoms and efficiency of functioning are the effects of proper *tarpaṇa*.

Excessive *tarpaṇa* causes profuse tears, heaviness, unctousness of the eyes, whereas insufficient *tarpaṇa* causes dryness, dirty tears and increase of the original disease. *Rukṣaṇa* and *sneha* therapies respectively are to be done for the above two conditions.

Puṭapāka

अत ऊर्ध्वं प्रवक्ष्यामि पुटपाकस्य साधनम् ।।
द्वौ बिल्वमात्रौ मासस्य पिण्डौ स्निगधौ सुपेषितौ । द्रव्याणां बिल्वमात्रं तु द्रवाणां कुडवो मतः ।।
तदेकस्थं समलोड्य पत्रैः सुपरिवेष्टितम् । पुटपाकेन तत्पक्त्वा गृह्णीयात्तद्रसं बुधः ।।
तर्पणोक्तविधानेन यथावदुपचारयेत् । दृष्टिमध्ये निषेच्यः स्यान्नित्यमुत्तानशायिनः ।।

(शा. उ. १३/५०-५२)

Process

Two *bilwa pramāṇa* (*Two palas*) of flesh (mutton devoid of bones) one *bilwa* of other drugs;' one

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kuḍava of any liquid are all made into a paste, covered with leaves and packed in mud. When it slightely dries, it is put into fire and later removed, mud coat peeled off and juice exstracted from the bolus inside. This juice is put into the eyes in the same way as of *tarpaṇa* therapy.

स्नेहनो लेखनश्चैव रोपणश्चेतिस त्रिधा । हितः स्निग्धोऽतिरूक्षस्य स्निग्धस्यापि हि लेखनः ।।
दृष्टेर्बलार्थमितरः पित्तासृग्व्रणवातनुत् । (शा. उ. १३/५६-५७)

Snehana, lekhana and *ropaṇa* are the three kinds of *putapāka*, *snehana* is suited for dry eye, *lekhana* for the eye which is having thick and unctous secretions, where as *ropaṇa* is ideal for strengthening the vision and curing ulcers and disorders of *pitta*, *rakta* and *vāta*.

सर्पिर्मांसवसामज्जामेदः स्वाद्वौषधै कृतः ।। स्नेहनः पुटपाकश्च धार्यो द्वे वाक्शते दृशोः ।
(शा. उ. १३/५७-५८)

Puṭapāka of ghee, mutton muscle fat, marrow, fat drugs of sweet taste constitute *snehana puṭapāka* and should be retained for a period of 200 *Mātra kālās*.

जाङ्गलानां यकृन्मांसैर्लेखनद्रव्यसंयुतैः ।। कृष्णलोहरजस्ताम्रशङ्खविद्रुमसिन्धुजैः ।
समुद्रफेनकासीसस्रोतोजदधिमस्तुभिः ।। लेखनो वाक्शतं धार्यस्तस्यैताद्विधारणम् ।
(शा. उ. १३/५८-६०)

Puṭapāka prepared with liver of animal of *jāṅgala deśa* drugs possessing *lekhana* property, dust of iron, copper, conch, coral, *saindhava, samudra- phena*, *kāsīsa*, *srotañjana* and when constitutes *lekhana puṭapāka* and it should be retained for a period of 100 *Mātrā kālās*.

स्तन्यजाङ्गलमध्वाज्यतिक्तकद्रव्यपाचितः ।।
लेखनात्त्रिगुणो धार्यः पुटपाकस्तु रोपणः । वितरत्तपणोक्तां तु क्रियां व्यपत्तिदर्शने ।। (शा. उ. १३/५८-६०)

Puṭapakā prepared out of breast milk, both of flesh of *jāṅgala* animals, honey, ghee and drugs of bitter taste, constitute *ropaṇa puṭapāka* and it should be retained for a duration of three times as of *lekhana putapāka.*

Any complications during this therapy should be treated similar to those of *tarpaṇa*.

Añjana

अथ संपक्वदोषस्य प्राप्तमञ्जनमाचरेत् । हेमन्ते शिशिरे चैव मध्याह्नेऽञ्जनमिष्यते ।।
पूर्वाह्णे चापराह्णे च ग्रीष्मे शरदि चेष्यते । वर्षासु नाभ्रे नाप्युष्णे वसन्ते च सदैव हि ।।
(शा. उ. १३/६२-६३)

Añjana (collyrium) is applied to the eyes when the *doṣas* have become *pakva*, in the afternoons during *hemanta* and *śiśira ṛtus*, during mornings in *grīṣma* and evening in *śarat*, when there is neither too cold nor too much of heat during *varṣā;* and any time during *vasanta*.

लेखनं रोपणं चैव तथा स्यात्स्नेहनाञ्जनम् । लेखनं क्षारतीक्ष्णाम्लरसैरञ्जनमिष्यते ।।
कषायतिक्तरसयुक्तनेहं रौपणं मतम् । मधुरं स्नेहसंपन्नमञ्जनं तु प्रसादनम् ।।
(शा. उ. १३/६४-६५)

Añjana is of three types, *lekhana, ropaṇa* and *snehana*. *Añjana* prepared with *kṣāras tīkṣṇa* and *āmla* drugs constitute *lekhana,* that prepared with drugs of *kaṣāya* and *tiktarasās* and oil or ghee constitute *ropaṇa*, and *añjana* containing drugs of *madhura* and oil or ghee constitute *snehana añjana*.

गुटिकारसचूर्णानि त्रिविधान्यञ्जनानि च । कुर्याच्छलाकयाऽङ्गुल्या हीनानि च यथोत्तरम् ।। (शा. उ. ६६)

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Añjanas can be prepared in the form of pill, liquid or powder and are applied to the eyes with a rod or fingers, each succeeding one is poorer in efficacy than the previous.

श्रान्ते प्ररुदिते भीते पीतमद्ये नवज्वरे । अजीर्णे वेगघाते च नाञ्जनं संप्रशस्यते ।। (शा. उ. १३/६७)

Añjana should not be applied to persons who are tired, weeping, frightful, intoxicated with alcoholic drinks, in early stages of fevers, indigestion and during suppression of urges.

हरेणुमात्रां कुर्वीत वर्ति तीक्ष्णाञ्जने भिषक् । प्रमाणं मध्यमेऽध्यर्धं द्विगुणं तु मृदौ भवेत् । (शा. उ. १३/६८)

Varti anjaña if very powerful, should be applied in doses on one *harenu* if of medium potency one and half *hareṇus*, and if of mild potency two *harenus*.

रसक्रिया तूत्तमा स्यात्त्रिविडङ्गमिता हिता । मध्यमा द्विविडङ्गा स्याद्धीना त्वेकविडङ्गिका ।। (शा. उ. १३/६९)

Rasakriyā in doses of three *viḍangas* is considered as maximum, two *viḍangas* as medium and one *viḍanga* as least.

वैरेचनिकचूर्णं तु द्विशलाकं विधीयते । मृदौ तु त्रिशलाकं स्याच्चतस्रः स्नैहिकोऽञ्जने ।। (शा० उ० ७०)

Cūrṇa añjana if possessing purgative action to the eyes should be applied twice with *śalāka* (metallic rod), if of mild potency thrice and if possessing *snehana* action four times.

मुखयोः कुण्ठिता श्लक्ष्णा शलाकाष्टाङ्गुलोन्मिता । अश्मजा धातुजा वा स्यात्कलायपरिमण्डला ।।
ताम्रलोहश्मसंजाता शलाका लेखने मता । सुवर्णरजतोद्भूता शलाका स्नेहने मता ।।
अङ्गुलीव मृदुत्वेन कथिता रोपणे बुधैः ।। (शा. उ. ७१-७३)

The *śalākā* should be eight *aṅgulīs* in length and it's applying end resembling a flower but.

The rod prepared with copper, iron or stone is ideal for *lekhana* action, that of gold or silver for *snehana* action and finger itself best for *ropaṇa* action.

सायं प्रातर्वाञ्जनं स्यात्तत्सदा नैव कारयेत् ।।
नातिशीतोष्णवाताभ्रवेलायां संप्रशस्यते । कृष्णभागादधः कुर्यादपाङ्गं यावदञ्जनम् ।। (शा० उ० ७३-७४)

Añjana can be done either in the morning or evening but not always, neither during too much heat nor too much cold, heavy breeze or clouds is also not suitable. *Añjana* drug should be applied below the *kṛṣṇabhāga* upto the outer corner of the eye.

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Chapter 24

MUKHA KALPANĀ

Gaṇḍūṣa and kavla kalpanā

मुखं सञ्चार्यते या तु मात्रा सा कवलः स्मृतः । असञ्चार्या तु या मात्रा गण्डूषः स प्रकीर्त्तितः ।।

(स. चि. ४०/६२)

कवले तु पर्यायेण कपोलौ कण्ठं सञ् चारयेत । अयमेव कवलगण्डूषयोर्विशेषः ।। (अ. सं. सु. ३१)

असञ्चारी मुखे पूर्णे गण्डूषः कवलश्चरः । तत्र द्रवेण गण्डूषः कल्केन कवलः स्मृतः ।। (शा. उ. ख. १०/४)

Gaṇḍūṣa

Gaṇḍūṣa is process of holding any medicated liquid (*Kwātha, swarasa, madhu, ghṛtha, taila, gomūtra, uṣnodaka, māṁsarasa, sītakaṣāya, āmlodaka, kṣārodaka* etc.) in the mouth to its full capacity without any movement in side. In other words the complete filling of the oral cavity with medicated liquid is called *gaṇḍūṣa*.

Gaṇḍūṣa mātra

दद्याद् द्रवेषु चूर्णं च गण्डूषे कोलमात्रकम् । कर्षप्रमाणः कल्कश्च दीयते कवले बुधैः ।।

(शा. उ. ख. १०/५)

Ācarya śaraṅgadhara mentioned that, *one kola* by measure is the dose of either a liquid or a powder for *gaṇḍūṣa*.

Kavala

Kavala is that which allows movement of the medicated liquid (*Kwātha, swarasa, madhu, ghṛtha, taila, gomūtra, uṣnodaka, māṁsarasa, sītakaṣāya, āmlodaka, kṣārodaka* etc.) or medicated kalka (paste of drugs mixed with a little water- according to *Ācaryā śāraṅgadhara*). In other words, the particular dose of medicine which provides convenient movement *kavala* or *kavala gṛaha*. In *Aṣṭāṅgasaṅgraha* it is mentioned that, *kavala sancāraṇa* (movements) should be upto the level of *kaṇtha*. Hence it can be compared with gargle. Usually *Trikaṭu cūrṇa, vaca, cūrṇa, harītaki cūrṇa* etc. are made in to *kalka* form and they are mixed in *taila, sūra, mūtra, kṣārodaka, madhu* etc. any one of liquid and used for *kavala*.

If medicine is used in the form of *kalka*, *Ācaryā śāraṅgadhara* has mentioned that, for *kavala* the dose of *kalka* is one *karṣa*.

Depending upon the nature of the medicine used for *gaṇḍūṣa* is of four kinds.

चतुर्विधः स्यद्गण्डूषः स्नैहिकः शमनस्तथा । शोधनो रोपणश्चैव कवलश्चापि तद्विधः ।।

(शा. उ. ख. १०/१)

Gaṇḍūṣa is of four kinds viz. *snaihika, śamana, śodhana* and *ropaṇa*, like wise is *kavala*,

Snaihika gaṇḍūṣa kalpanā for vātaja vyādhies

तिलकल्कोदकं क्षीरं स्नेहो वा स्नैहिके हितः ।। (शा. उ. ख. १०/८)

For *snaihika gaṇḍūṣa*, a paste of *tila*, with water or milk and oil is ideal.

तिला नीलोत्पलं सर्पिः शर्करा क्षीरमेव च । सक्षौद्र हनुवक्रस्थो गण्डूषो दाहनाशनः ।।

(शा. उ. ख. १०/९)

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Tila, *nīlotpala, ghee* , sugar, milk and honey together forms a good gargle for burning of the mouth and throat.

वैशद्यं जनयत्यास्ये संदधाति मुखव्रणान् । दाहतृष्णाप्रशमनं मधुगण्डूषधारणम् ।। (शा. उ. ख. १०/१०)

Honey alone used as *gaṇḍūṣa* clears the mouth, heals ulcers, alleviates burning and thirst.

विषक्षाराग्निदग्धे च सर्पिर्धार्यं पयोऽथवा । तैलसैन्धवगण्डूषो दन्तचाले प्रशस्यते ।। (शा. उ. ख. १०/११)

Ghee is to be used as gargle in cases of poisoning and scalds by alkalies or fire. In cases of shaky teeth, gargle with *taila* mixed with *saindhava* is ideal.

शोषं ममुखस्य वैरस्यं गण्डूषः काञ्जिको जयेत् । सिन्धुत्रिकटुराजीभिरार्द्रकेण कफे हितः ।।

(शा. उ. ख. १०/१२)

Gargle with *kāñjika* is good for dryness of mouth and *vairasya*, mixed with *saindhava, trikaṭu, rājika*, *ārdraka* it is effective in disorders of *kapha*, gargle of *triphalā* and honey mitigate *kapha, rakta* and *pitta*.

Mukhapāka gaṇḍūṣa

दार्वी गुडूची त्रिफला द्राक्षा जात्याश्च पल्लवाः ।।
यवासश्चेति तत्क्वाथः षठांशक्षौद्रसंयुः । शीतो मुखे घृतो हन्यान्मुखपाकं त्रिदोषजम् ।।

(शा. उ. ख. १०/१३-१४)

Darvi, guḍūcī, triphalā, drākṣa , tender leaves of *jatī* and *yavasa* made into a decoction , mixed with one sixth part of honey and held in the mouth, heals ulcers of the mouth caused by all the three *doṣas*.

केशरं मातुलुङ्गस्य सैन्धवोषणसंयुतम् । हन्यात्कवलतो जाढ्यमरुचिं कफवातजाम् ।। (शा. उ. ख. १०/१६)

Keśara of *mātulunga, saindhava, marica* used as *kavala* relieves diseases of *kapha* and *vata* and cures *aruchi*.

Age of the *patient* and *method* of *administration* of *kavala* and *gaṇḍūṣa*.

कस्मिम् वयसि गण्डूषो धार्यते कियत्परिमिता गण्डूषः कार्या इत्याह
धार्यन्ते पञ्चमाद्वर्षाद्गण्डूषकवलादयः । गण्डूषान्सुस्थितः कुर्यात्स्विन्नभालगलादिकः ।।
मनुष्यस्त्रींस्तथा पञ्च सप्त वा दोषनाशनात् । कफपूर्णास्यत यावच्छेदो दोषस्य वा भवेत् ।।
नेत्रघ्राणस्रुतिर्यावत्तावद्गण्डूषधारणम् । (शा. उ. ख. १०/५-७)

Gaṇḍūṣa and *kavala* are advocated after the age of five years. The person to be given this therapy should be seated comfortably, his forehead, neck and shoulders given mild fomentation, asked to take the liquid into the mouth and hold it till his mouth gets cleared of accumulated *kapha* or other *doṣas* or till he gets secretions inside his nostrils. At a stretch, three, five or seven gargles can be done to get rid of the *doṣās*.

Characters of proper therapy gaṇḍūṣa

व्याधेरपचयस्तुष्टिर्वैशद्यं वक्त्रलाघवम् ।। इन्द्रियाणां प्रसादश्च गण्डूषे शुद्धिलक्षणम् । (शा. उ. ख. १०/२०)

A proper therapy of *gaṇḍūṣa* brings about alleviation of diseases, cleanses the mouth and stimulates the sense organs.

Characters of Inadequate gaṇḍūṣa

हीनयोगात्कफोत्क्लेशो रसाज्ञानारुची तथा ।। अतियोगान्मुखे पाकः शोषस्तृष्णा क्लमो भवेत् । (शा. उ. ख. १०/१९)

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Inadequate gargling therapy causes profuse salivation., loss of taste perception and anorexia, whereas excessive therapy produces ulcers, dryness, thirst and exhaustion.

Indications of Gaṇḍūṣa and Kavala

Manyastambha, sirahśūla, karnaśūla, mukharoga, netraroga, praseka, kaṇṭharoga, hṛllāsa, mukhasoṣa, tandra, aruci, pīnasa etc.

Pratisāraṇa(Manjan)

Application of *kalka* or *cūrṇa* form of the medicine with tip of the finger inside the mouth is done with the same drugs as indicated for *gaṇḍusa* and *kavala*.

कल्को रसक्रिया क्षौद्रं चूर्णं चेति चतुर्विधम् । अङ्गुल्यग्रप्रणीतं तु यथास्वं मुखरोगिणम् ।।
(सु. सू. ४०)

यस्योशधस्य गण्डूषस्तस्य वै प्रतिसारणम् । कवलश्चापि तस्यैव ज्ञेयोऽत्र कुशलैर्नरैः ।।
(शा. उ. ख. १०/१५)

Ācaryā suśruta mentioned that *pratisāraṇa* is four types, like wise.

1. Kalka 2. Rasakriya 3. Madhu 4. Cūrṇa

Where as Ācarya Śāraṅgadhara mentioned pratisāraṇa as 3 types

कल्कोऽवलेहश्चूर्णं च त्रिविधं प्रतिसारणम् । अङ्गुल्यग्रगृहीतं च यथास्वं मुखरोगिणम् ।
(शा. उ. ख. १०/१७)

Pratisāraṇa is of three kinds, *kalka, avaleha* and *cūrṇa* and used by the tip of the finger in all diseases of the mouth.

Hence *manjan* (tooth poweders) also considered under *pratisāraṇa kalpanā*.

Pratisāraṇa yoga

कुष्ठं दार्वी समङ्गा च पाठा तिक्ता च पीतिका । तेजनी मुस्तलोध्रे च चूर्णं स्यात्प्रतिसारणम् ।।
रक्तस्रुतिं दन्तपीडां शोथं दाहं च नाशयेत् । (शा. उ. ख. १०/१८)

Kuṣṭha, dārvī, samaṅga, pāṭhā, tikta, pītika, tejanī, musta and *lodhra*- all equal parts made into nice powder applied to mouth stops bleeding, pain, swelling and tooth ache.

Irimedadi Taila

इरिमेदत्वचं क्षुण्णां पचेच्छतपलोन्मिताम् । जलद्रोणे ततः क्वाथं गृह्णीयात्पादशेषितम् ।।
तैलस्यार्धाढकं दत्त्वा कल्कैः कर्षमितैः पचेत् । इरिमेदलवङ्गाभ्यां गैरिकागरुपद्मकैः ।।
मंञ्जिष्ठालोध्रमधुकैर्लाक्षान्यग्रोधमुस्तकैः । त्वग्जातीफलकर्पूरकङ्कोलखदिरैस्तथा ।।
पतङ्गधातकीपुष्पसुक्ष्मैलानागकेशरम् । कट्फलेन च संसिद्धं तैलं मुखरुजं जयेत् ।।
प्रदुष्टमांसं पलितं शीर्णदन्तं च शौषिरम् । श्यावदन्तं प्रहर्षं च विद्रधिं कृमिदन्तकम् ।।
दन्तस्फुरणदौर्गन्ध्यं जिह्वातात्वोष्ठजां रुजम् । (शा. म. ख. ९/१६३-१६८)

Apparatus Required

Taila pātra, khalva yantra,kwātha pātra, cloth etc.

Drugs Required

1. *Irimeda(yavakūṭa cūrṇa)* *100 palas*

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2.	*Water*	*1 dorṇa*
3.	*Tila taila*	*1/2 āḍhaka*
4.	*Irimeda twak*	*1 karṣa*
5.	*Lavanga*	*1 karṣa*
6.	*Gairika*	*1 karṣa*
7.	*Agaru*	*1 karṣa*
8.	*Padmaka*	*1 karṣa*
9.	*Manjiṣṭa*	*1 karṣa*
10.	*Lodhra*	*1 karṣa*
11.	*Madhuka*	*1 karṣa*
12.	*Lākṣa*	*1 karṣa*
13.	*Nyagrodha*	*1 karṣa*
14.	*Musta*	*1 karṣa*
15.	*Twak*	*1 karṣa*
16.	*Jātiphala*	*1 karṣa*
17.	*Karpura*	*1 karṣa*
18.	*Kankola*	*1 karṣa*
19.	*Khadiraśarā*	*1 karṣa*
20.	*Pattanga*	*1 karṣa*
21.	*Dhātaki puṣpa*	*1 karṣa*
22.	*Sūkṣma elā*	*1 karṣa*
23.	*Nāgakeśara*	*1 karṣa*
24.	*Katphala*	*1 karṣa*

Procedure

One hundred *palas* of *yavakūṭa cūrṇa* of *irimeda twak* is boiled in one *droṇa* of water, till contents are reduced to quarter and then contents are filtered. *Half aḍhāka* of *tila taila* is added to the prepared *kwātha* in a *taila pātra*, then *kalka* is prepared with one *karṣa* each of drugs no-4 to no-24 is added and *taila pāka* is done. Then after attaining the proper *pāka, taila* is filtered and obtained product is called *irimedadi taila.*

Āmayika Prayoga

This oil relieves the diseases of the mouth such as *duṣṭamāṁsa* of *dantas*, *palita danta*, *ṣīrna danta*, *souṣira*, *syāvadanta*, *praharṣa*, *vidradhi*, *kṛmi danta*, *danta sphutana*, *dourgandhya* and *jihwa*, *tālu*, *oṣṭa ṛjam.*

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Chapter 25

NĀSIKA KALPANĀ

नस्तः कर्म च कुर्वीत शिरोरोगेषु शास्त्रविद् । द्वारं हि शिरसो नासा तेन तद् व्याप्य हन्ति तान् ।।

(च. सि. ६/८८)

औषधमौषधसिद्धो वा स्नेहो नासिकाभ्यां दीयत इति नस्यम् । (सु. चि. ४०/२१)

नस्यं तत्कथ्यते धीरैर्नासाग्राह्यं यदौषधम् । नावनं नस्यकर्मेति तस्य नामद्वयं मतम् ।। (शा. उ. ८/९)

Nasya (nasya-karma) is a term to be applied generally for medicines(medicated oils) administered through the nasal passage. It is also known as *nāvana* and *nasya kārma*. The formulations used for the purpose of *nasya kārma* are called *nāsikakalpanās* (*nāsa-kalpa*).

The learned physician should administer *nasya kārma* in diseases of head because nose is the gate way of head and as such drug administered by this root enters the head and thus destroys the diseases, there of *śirovirecana, śirovireka* and *mūrdha virecana* are the synonyms of *nasya kārma*.

Classifications of nasya

Depending upon the pharmacological actions of drugs used in *nasya kārma* scholars of *Āyurveda* have mentioned different varieties of *nasya kārma*.

Caraka has classified nasya as follows

नावनं चावपीडश्च ध्मापनं धूम एव च । प्रतिमर्शश्च विज्ञेयं नस्तः कर्म तु पञ्चधा ।।
स्नेहनं शोधनं चैव द्विविधं नावनं स्मृतम् । शोधनः स्तम्भनश्च स्यादवपीडो द्विधा मतः ।।
चूर्णस्याध्यामपनं तद्धि देहस्रोतोविशोधनम् । विज्ञेयस्त्रिविधो धूमः प्रागुक्तः शमनादिकः ।।
प्रतिमर्शो भवेत्स्नेहो निर्दोष उभयार्थकृत् । एवं तद्रेचनं कर्म तर्पणं शमनं त्रिधा ।।

(च. सि. ९/८१-९२)

1. *Nāvana :* a. *Snehana* b. *Śodhana*
2. *Avapīḍa* : a. *Śodhana* b. *Stambhana*
3. *Dhmāpana*
4. *Dhumā nasya* : a. *Prāyogika* b. *Virecanīya* c. *Snehaniya*
5. *Pratimarśa* : a. *Snehana* b. *Virecana.*

The above mentioned five types of *nasyas* are grouped according to their actions in to following three classes.

1. *Recana, 2. Tarpana, 3. Śamana*

Scholar caraka also describes 7 types of nasyas on the basis of the usable parts of the *nasya* drugs viz.

1. Phala nasya, 2. Patra nasya, 3. Mūla nasya 4. Kāṇda nasya , 5. Puṣpa nasya , 6. Niryāsa nasya and 7. Twak nasya.

All the above mentioned drugs can be used for *nasya* in the form of *cūrṇa, kalka, swarasa, kṣīra, kwātha, sāra, udaka, dhūma, māṁsa rasa, siddha taila, ghṛta, madya* etc.

तद् द्विविधम्-शिरोविरेचनं स्नेहनं च । तद्द्विविधमपि पञ्चधा । तद्यथा-नस्यं, शिरोविरेचनं, प्रतिमर्शो, अवपीडः प्रधमन

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च । तेषु नस्यं प्रधान शिरोविरेचनं च । नस्यविकल्पः प्रतिमर्शः शिरोविरेचन-विकल्पोऽवपीडः प्रधमनं च, ततो नस्यशब्दः पञ्चधा नियमितः ।। (सु. चि. ४०.२१)

Scholar Suśruta has broadly classified *nasya* in to the following two groups: 1. *Śirovirecana* 2 . *Snehana*

Both these above mentioned types of *nasyas* are further subdivided into the following five types.

1. Nasya *2. Śirovirecana*

3. Pratimarśa *4. Avapīḍa*

5. Pradhamana.

Scholar Vāgbhaṭṭa has classified *nasya* having in view their actions, in to the following three types :

1. Virecana – nasya 2. Bṛmhaṇa-nasya 3. Śamana-nasya.

Scholar *śārṅgadhara* has classified nasya in to two types :

नस्यभेदो द्विधा प्रोक्तो रेचनः स्नेहनस्तथा । रेचनं कर्षणं प्रोक्तं स्नेहनं बृंहणं मतम् ।। (शा० सं० उ० ख० ८.२)

1. *Recana nasya (karṣaṇa)* : a. *Avapīḍa* b. *Pradhamana* 2. *Snehana (bṛmhaṇa)* : a. *Marśa* b. *Pratimarśa*

Seeing the above mentioned classification, it becomes obvious that there are several types of *nasyas* enumerated in *Āyurvedic classics*. But all the types of *nasyas* are almost incorporated in *carakās* classification. Hence detailed description of *nasya* varieties mentioned by *scholar caraka* has mentioned here under.

Nāvana nasya

It is an important type of nasya, which can be used always, It can be mainly classified in to *snehana* and *śodhana. Scholar suśruta* has called it as *snehana- nasya. Nāvana* is administered by instilling the drops of a medicated oil in the nose. *Aṇutaila* is used for this type of *nasya*. In this type of *nasya* the picu of *kārpāsa* is made and dipped into *sneha*, the drops, formed after taking the picu out of the *sneha*, are dropped in to the nostrils, *Nāvana* is generally a *sneha nasya* and is known as *nasya* in general. The *nāvana nasya* is indicated in following conditions.

1. Vātaja śiroroga *2. Danta pāta*

3. Keśa pāta *4. Smaśṛ pāta*

5. Tīvrakarṇa śula *6. Karṇachweda*

7. Timira *8. Swedopaghāta*

9. Nāsā roga *10. Mūkha śoṣa*

11. Avabāhuka *12. Akālaja valee*

13. Akālaja palita *14. Dāruṇa prabodha*

15. Vāta- pittaja mukharoga.

Nasya (nāvana) should be administered according to the following time schedules :

1. In *kaphaja roga* : Fore – noon
2. In *pittaja roga* : Noon
3. In *vātaja roga* : After- noon

In healthy persons *nasya* should be given according to the following seasonal schedule :

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1. *Śīta kala :* noon
2. *Śarad* and *vasanta:* Morning
3. *Grīṣma ṛtu :* evening
4. *Varṣa ṛtu :* only when sun is visible

Avapīḍa nasya

Avapīḍa nasya is the *nasya* consisting of the extract (juice) of a drug administered through *nasal* passage. Four, six, eight, drops of the *swarasa* are recommended to be put in each nostril (Depending upon the pharmacological action of drugs used for *avapiḍa nasya*, it is of two types 1) *stambhana nasya* 2) *śodhana nasya.*

Avapīḍa nasya is indicated in the following conditions

1. *Viṣābhighāta*
2. *Sanyāsa*
3. *Mūrcchā*
4. *Moha*
5. *Apatantraka*
6. *Mada*
7. *Apasmāra*
8. *Śirobhedana*
9. *Krodha*
10. *Bhaya*
11. *Manāsa roga*
12. *Citta vyākulawastha*
13. *Kṛśa rogi*
14. *Bhīru*
15. *Sukumāra persons*
16. *Stri*
17. *Raktapitta etc.*

Dhmāpana (pradhamana) nasya

Pradhamana is a specific *śodhana nasya*. In *pradhamana nasya*, *cūrṇa* (powder of drugs) is administered(inhaled) by nasal passage with the help of a *nāḍī yantra*. Its dose as described by scholar *videha* is one *mucyuṭi* (a pinch).

The drugs generally used are *saiṇdhava lavaṇa*, *lasuna, guggulu, katphala, marīca*, vaca etc. These are mixed in equal parts and powdered along with the gall stones of a fish and kept dry. The powder may be used as *pradhamana nasya.*

Pradhamana nasya is indicated in following conditions

1. Mental diseases 2. Poisoning 3. Krimija Śiroroga.

Dhūma nasya

Dhūma nasya is defined as medicated fume taken by nasal route and eliminated by the oral route. If *dhūma nasya* taken by oral route is eliminated by the *nasal* route, is harmful for the eyes.

Dhūma nasya is of the following types

1. Prāyogika 2. Snehana 3. Vairecanika

Its indications are as fallows:

1. Śiro roga 2. Nāsa roga 3. Aksiroga

Marśa- Pratimarśa nasya

Both consist of introduction of *sneha (taila)* through the nostrils. It is well tolerated and is a very much convenient procedure. *Prati- marśa* and *marśa* are in principles the same but they have the following distinctions (on the basis of dose etc.)

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Pratimarśa	*Marśa*
1. Dose-2 drops morning and evening.	*1. Dose - Uttama mātra - 10drops, Madhyama mātra -8 drops. Hīna mātra - 4 drops*
2. Indicated in all seasons and in all age group.	2. Needs consideration of seasons and age.
3. No complications	3. May produce complications.
4. Slow acting and less potent action.	4. Quickly effective and highly potent action.

Pratimarśa is indicated in the following conditions

1. *Talpothita kāla*
2. *Trakṣālita danta kāla*
3. *Gṛhanirgachata kāla*
4. *Vyāyāmottara kāla*
5. *Vyavayottara kāla*
6. *Adhva pariśrānta kāla*
7. *Mala-mūtra visarjanottara kāla*
8. *Kavalottara kāla*
9. *Anjanottara kāla*
10. *Bhojanottara kāla*
11. *Vamanottara kāla*
12. *Divaswapnottara kāla*
13. *Sāyankala*
14. *Śirobhyyangottara kāla*
15. *Hasyottara kāla*

Nasya Drugs Mentioned by Different Authors

A large number of drugs have been advocated for use in *Nasya Karma*. These drugs are listed below:

According to Scholar Caraka

1. *Apāmārga seed*
2. *Pippalī*
3. *Marīca*
4. *Śigru*
5. *Viḍanga*
6. *Sarṣapa*
7. *Tumburu*
8. *Jīraka*
9. *Ajamodā*
10. *Pīlu*
11. *Hareṇukā*
12. *Pṛthvīkā*
13. *Surasā*
14. *Swetā*
15. *Kuṭheraka*
16. *Fadīnjaka*
17. *Śirīṣa seed*
18. *Lasuna*
19. *Haridrā*
20. *Dāru Haridrā*
21. *Śunṭhī*
22. *Souvarca lavaṇa*
23. *Jyotiṣmati*
24. *Śallaki extract*
25. *Tejovatī*
26. *Ingudi*
27. *Twak*
28. *Vārtakī*
29. *Elā*
30. *Sumukha*
31. *Gaṇḍīraka*
32. *Kālmālaka*
33. *Parnasa*
34. *Śringa Vera*
35. *Mūlaka*
36. *Tarkārī*
37. *Arka*
38. *Alarka (Swetapuṣpā extract)*
39. *Kuṣtha*
40. *Nāga Dantī*
41. *Vacā*
42. *Indrāyaṇa*
43. *Awāk Puṣpī*
44. *Bṛscikālī*
45. *Brāhmī*
46. *Ativiṣa Mūla*
47. *Lodhra*
48. *Saptaparṇa*
49. *Madanaphala*
50. *Nimba*

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51. Devadaru 52. Agaru extract 53. Sarala extract
54. Guḍūcī 55. Hingu extract 56. Bṛhati
57. Kṣawaka 58. Ganḍīra 59. Saindhava Lavaṇa

According to scholar Suśruta

1. Pippalī 2. Viḍanga 3. Apāmārga
4. Śigrū 5. Sarṣapa 6. Śirīṣa
7. Marica 8. Karavīra 9. Bimbī
10. Swetāparājitā 11. Kinihi 12. Vacā
13. Jyotiṣmatī 14. Karanja 15. Arka
16. Alarka 17. Laśuna 18. Atīśa
19. Śuṇthī 20. Tālīśapatra 21. Arjaka
22. Tamālapatra 23. Sursā (Tulasī) 24. Ingudī
25. Medhāśṛingī 26. Murangī 27. Pīlu
28. Mātulungi (Bijourā) 29. Jātī (Camelī) 30. Sāla
31. Tāḍa 32. Madhūka 33. Lākṣa
34. Hingu 35. Lavaṇa 36. Madya
37. Gomaya 38. Gomūtra

According to Scholar Vagbhatta

1. Vidanga 2. Apāmārga 3. Trikaṭu
4. Dāru Haridrā 5. Rāka (Niryāsa) 6. Śirasa
7. Śigru 8. Bṛhatī 9. Saindhawa
10. Madhuka Sāra 11. Rasouta (Dāruharidrā Ghanasattwa)
12. Elā 13. Bṛhat Elā 14. Hingu Pattri

Indications of Nasya Karma

1. Śirastambha 2. Manyāstambha 3. Pinasa
4. Dantastambha 5. Hanustambha 6. Galaśāluka
7. Galaśunḍikā 8. Śukragata Roga 9. Timira
10. Vartma Roga 11. Byanga 12. Amśaśūla
13. Upajihwikā 14. Ardhāwabhedaka 15. Karṇaśūla
16. Grewa roga 17. Skandha Roga 18. Nāsāśūla
19. Mukha Roga 20. Akṣiśūla 21. Śiraḥśūla
22. Ardita 23. Apatantraka 24. Apatānaka
25. Galaganḍa 26. Dantaśula 27. Rājī
28. Danta harṣa 29. Arbuda 30. Vākgraha
31. Swarabheda 32. Gadagadatwa 33. Krathana

Contraindications of Nasya Karma

1. Bhukta- Bhakta 2. Ajīrṇa 3. Pītasneha

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4. *Pītamada* 5. *Pīta toya* 6. *Kṣudhārta*
7. *Snehādi Pitukama* 8. *Śnata śira* 9. *Śramārta*
10. *Matta* 11. *Snātukama* 12. *Mūrcchita*
13. *Śastradandhata* 14. *Vyawāya Klānta* 15. *Virikta*
16. *Vyāyāma Klānta* 17. *Pānaklānta* 18. *Garbhiṇī*
19. *Nawa Jwara* 20. *Śokaistapta* 21. *Anuwāsita*
22. *Nawa Pratiśyāya* 23. *Apatarpita* 24. *Pītadrava*
25. *Tṛṣṇārta* 26. *Garārta* 27. *Kruddha*
28. *Bāla* 29. *Bṛddha* 30. *Sutika*
31. *Begāwarodhita* 32. *Rakta Srāvita* 33. *Śwāsa*
34. *Kāsa*

Nasya Auṣadhi Kalpanā

Drugs required for induction and management of *śirovirecana (Nasyakarma)* should be collected in the form of :

1. *Kalka* 2. *Cūrṇa*
3. *Kwātha* 4. *Kṣīra*
5. *Udaka* 6. *Sneha*
7. *Dhūma etc.*

The following are the common drugs used for *Śirovirecana Karma.*

Commonly used Nasya Auṣadhi Kalpanās

Cūrṇa Kalpanā

1. *Kaṭphala cūrṇa* 2. *Trikaṭu cūrṇa*
3. *Kaṭu tumbi curṇa* 4. *Pippalī cūrṇa*
5. *Marica cūrṇa* 6. *Viḍanga cūrṇa*

Sneha Kalpanā

1. *Aṇu taila* 2. *Ṣaḍabindu taila*
3. *Jātyadi taila* 4. *Padmakādi taila*
5. *Pancaguṇa tiala* 6. *Vacā*
7. *Ghṛta* 8. *Ghanasara yoga.*

Nasya Yantra

A suitable *Nasya Yantra* may be devised according to the need depending upon the following outlines described in the text for *Dhūma Nasya.*

S. No.	Types of Nasya	Netra length in Angula
1.	*Tīkṣṇa* or *Virecana Nasya*	24 *angula*
2.	*Snaihika Nasya*	32 *angula*
3.	*Prayogika* or *Samana Nasya*	36 *angula*

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Observation of Ātura-Vaya and Kāla

Ṛtu : *Nasya* should be given in *Prāvṛṭa*, *Śarad* and *Vasanta Ṛtus*. Time schedules in different seasons should be as below :

S. No.	Ṛtus	Nasya given in
1.	*Gṛīṣma Ṛtu*	Before Noon
2.	*Śita Ṛtu*	Noon
3.	*Varṣā Ṛtu*	Day should be clear

Age

Nasya should not be given in persons below 7 years or after 80 years of age. Thus *Nasya* is indicated between 8 to 80 years of age However, the following exceptions have also been admitted.

1. *Pratimarśa* may be administered at any age between birth to death while.
2. *Dhūma* is indicated after 12 years of age.

Sneha Pāna should not be given immedieately before *Nasya karma*.

Procedure of Nasya Karma

The procedure of *Nasya Karma* for routine puropose is described here under in a simplified flow sheet broadly based on *Suśruta's* descriptions.

1. *Ātura, Mal-Mūtrādi Vega Nivṛtta.*
2. Diet should be given.
3. After some time tooth brush.
4. Adequate *Dhūmapāna* (for purification of nostrills, throat srotas).
5. Patient should lie down on *Nasya Śaiyā*.
6. Put oil (e.g. *Pañcaguṇa Taila, Kṣrīa balā taila*) on scalp for Massage.
7. *Mṛdu Snehana* on head. According to *Āyurvedic* texts Swedana should not be given on the head. But it is only done for elimination of *doṣa* and liquification of *doṣas*.
8. *Tāpa sweda* should be given in following region i.e. *Śira, Mukha, Nāsā, Manyā, Griwā, Kanṭha.*
9. After *Swedana* smooth massage be applied on following regions e.g. *Gala, Kapola,* and *Lalāṭa Pradeśa.*
10. *Nasya* be administered (during *Nasya* the patient should close his one nostrill and should inhale the drug through the other).

Determination of Dosage in Nasya Karma

Scholar *Śāraṅgadhara* describes the following dosage schedule for *Nasya Karmā*.

1. *Tikṣṇauṣadhi Mātrā* : *Cūrṇa*-1 *Ṣaṇa* (24 *Rattis*), *Drava*-8 *Vinḍu* (8 drops).
2. *Hingu*- 1 *Yava* (1/2 *Ratti*)
3. *Saindhava* – 1 *Māṣā* (6 *Ratti*)
4. *Dugdha* (Milk) 8 *Ṣāṇa* (64 drops)
5. *Jala* (*Auṣadhi Siddha*) 3 Tolas
6. *Śarkarā* and other *Madhūra guṇa dravayas 1 Tola*

According to *Suśruta Nasya* should be given for 21 days or till the appearance of adequate effects.

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On the other hand according to *Vāgbhaṭṭa Nasya* should be given for 7 days.

Instructions for the patients during Nasya

As described by *Caraka, Vāgbhaṭṭa* and *Suśruta* the following instructions should be observed by a patient while undergoing *Nasya Karma.*

1. Swedana and Mardana on the *Śira, Gātra* and *Manyā.*
2. Śira (head) should not be excessively flexed or extended.
3. Patient should lie supine (*Uttāna*) for a time interval consumble for counting numbers upto 100.
4. Avoid speech (Naprabhāṣet).
5. Avoid anger(Nakupyeta)
6. Avoid laughing (Nahaset).
7. Avoid swallowing of *Nasya Auṣadhi.*
8. Eliminate *Kapha* by *Ganḍūṣa* and *Ṣṭhīvana* (Spitting).

Post Nasya Regimen

1. *Dhūmapāna.*
2. Kawalagraha and *Ganḍūṣa Dhāraṇa.*
3. Diet-i. Warm water (*sukhoṣṇa jala*), ii. Light diet (*laghu āhāra*).

Following be avoided

1. *Śitala Jala* (cold water)
2. *Doṣa prakopaka Āhāra (abhiṣyandi)*
3. Rajodhūma (dust and fume)
4. *Sneha* (oils and ghee)
5. *Ātapa* (sun and heat)
6. Madya (alcohol)
7. *Śira Snāna* (bath by head)
8. *Atiyāna* (travelling)
9. *Krodha* (anger)
10. *Nidrā* (sleep)

Features of Adequate Nasya

1. *Lāghawa* (lightness in the body).
2. *Nidrā* (good sleep).
3. *Śira Laghutwa* (lightness in the head).
4. *Srotasa Śuddhi* (cleanising of channels).
5. Indriya Prasanna (sensorial happiness)
6. Mana Prasanna (mental happiness)

Features of Inadequate Nasya

1. *Indriya Rukṣatā* (Dryness of Senses).
2. *Apraśama Roga* (non relief).

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3. *Kanḍu* (Itching)
4. Anga gourawa (Heaviness in body).
5. *Nāsā, Netra, Mukha Srāwa* (Hyper secretion)

Features of Excessive Nasya

1. *Śiraḥśūla* (headache)
2. *Indriya Bibhrama* (confusion).
3. *Kapha Srawa* (salivation).

Nasya Vyāpada (Complications)

The complications of *Nasya Karma* (*Nasya Vyāpada*) are many and they occur due to (i) administration of Nasya when it is contraindicated and (ii) due to technical failure. These complications occur through following two modes:

1. *Doṣotkleśa* which can be managed by *Śodhana* and *Samana Cikitsā*.
2. *Doṣa kṣaya* which has to be managed by *Bṛmhaṇa Cikitsā*.

Advantages of Adequate Nasya Karma

1. Prevention of eye disease
2. Prevention of ear disease
3. Prevention of nasal disease
4. Healthy hair
5. Prevention of *Pīnasa, Ardhāwabhedaka, Śiraḥśūla, Ardita, Hanugraha.*
6. Provides strength to scalp (bone, joint, tendon, nerves).
7. Provides happiness
8. Improves voice
9. Improves senses
10. Prevention of *ūrdhwajatrugata* (head neck) Roga.
11. Delayed aging
12. Pleasant oral smell
13. Gives strength to head, *Danta. Śira, Trika, Vāhu* and *Urasa.*
14. Prevention of *Vali, Palita, Khālitya* and vyanga etc.

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Chapter 26
DHŪMAPĀNA KALPANĀ

Dhūmapāna or inhalation or medicated smokes are employed in certain diseases i.e. diseases of *kapha* and vata pertaining to head and neck, The patient may smoke through a pipe, certain substances put in a pot and burnt, or he may smoke specially prepared medicinal cigars.

Classification

According to scholar *caraka:*

विज्ञेयस्त्रिविधो धूमः प्रागुक्तः शमनादिकः ।। (च० सि० ९.११)

Dhumapāna Kalpanā (3)

Prāyogika — *Snaihika* — *Vairecanika*

According to scholar *suśruta*

धूमः पञ्चविधो भवति, तद्यथा-प्रायोगिकः, स्नैहिको, वैरेचनिकः कासघ्नो, वामनीयश्चेति । (सु. चि. ४०/३)

Dhūmapāna Kalpanā (5)

Prāyogika — *Snaihika* — *Vairecanika* — *Kāsaghna* — *Vāmaniya*

धूमस्तु षड़विधः प्रोक्तः शमनो बृंहणस्तथा । रेचनः कासहा चैव वामनो व्रणधूपनः ।।
शमस्य तु पर्यायौ मध्यः प्रायोगिकस्तथा । बृंहणस्यापि पर्यायौ स्नेहिको मृदुरेव च ।।
रेचनस्यापि पर्यायौ शोधनस्तीक्ष्ण एव च । (श.सं.उ.ख. ९/१-२)

Dhūmapāna Kalpanā (6)

Śamana — *Bṛmhaṇa* — *Recana* — *Kāsaghna* — *Vamana* — *Vraṇadhūpana*

Śamana has two synonyms, *madhya* and *prāyogika, bṛmhaṇa* has *snehana* and *mṛdu* as synonyms, while *śodhana* and *tīkṣna* are the synonyms of *recana*.

Dhūma Nāḍi

धूमनाडी भवेत्तत्र त्रिखण्डा च त्रिपर्विका ।।
कनिष्ठिकापरीणाहा राजमाषागमान्तरा । धूमनाडी भवेद्दीर्घा शमने रोगिणोऽङ्गुलैः ।।
चत्वारिंशन्मितैस्तद्वद्द्वात्रिंशद्भिर्मृदौ मता । तीक्ष्णे चतुर्विंशतिभिः कासघ्नी षोडशोन्मितैः ।।
दशाङ्गुलैर्वामनीये तथा स्याद्व्रणनाडिका । कलायमण्डलस्थूला कुलित्थागमरन्ध्रका ।।

(शा. सं. उ० खा. ९/११-१४)

The tube for fumigation consists of three pieces of the thickness of the little finger, the lumen permitting a *rājamāṣā* to pass freely through. Its length should be forty *aṅgulīs* in case of *śamana dhūma*; thirty-two *aṅgulīs* in cases of *mṛdu dhūma*, twenty four *aṅgulīs* for *tīkṣṇa*, sixteen *aṅgulī* for *kāsaghna;* twelve *aṅgulīs* for *vamana*. The tube for *vraṇa dhūma*, should have a passage permitting a pea and a mouth permitting a horsegram to pass through freely.

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अथेषिकां प्रलिम्पेच्च सुश्लक्ष्णां द्वादशाङ्गुलाम् । धूमद्रव्यस्य कल्केन लेपक्ताष्टाङ्गुल स्मृतः ।।
कल्कं कर्षमितं लिप्त्वा छायाशुष्कं च कारयेत् । ईषिकामपनीयाथ स्नेहाक्तां वर्तिमादरात् ।।
अङ्गारैर्दीपितां कृत्वा धृत्वा नेत्रस्य रन्ध्रके । वदनेन पिबेद्धूमं वदनेनैव संत्यजेत् ।।
नासिकाभ्यां ततः पीत्वा मुखेनैव वमेत्सुधीः । (शा. सं. उ. खा. ९/१५-१७)

A hollow reed of twelve *aṅgulīs* long is covered over with one *karṣa* of a nice paste of drugs of fumigation to a length of ten *aṅgulīs* leaving bare a space two *aṅgulīs* at any one end. It should be dried well in shade and the reed removed carefully. The roll of the paste is smeared with a little ghee and fixed to the nozzle without breaking it. It is lit at one end and smoke drawn into the mouth. The smoke is later left out through the mouth itself, or drawn through the nose and left out through the mouth.

शरावसंपुटे क्षिप्त्वा कल्कमङ्गारदीपितम् ।। छिद्रे नेत्रं निवेश्याथ व्रणं तेनैव धूपयेत् । (शा. सं. उ. खा. ९/१८)

I case of fumigation of ulcers, the paste , the paste of drugs is put on a plate containing burnig coal, covered with another plate containing a hole in its centre for the tube to be fixed and the outgoing fumes are lead over to the ulcer.

एलादिकल्कं शमने स्निग्धं सर्जरसं मृदौ ।।
रेचने तीक्ष्णकल्कं च कासघ्नं क्षुद्रिकोषणम् । वामने स्नायुचर्माद्यं दद्याद्धूमस्य पानकम् ।।
व्रणे निम्बवचाद्यं च धूपनं संप्रशस्यते । (शा. सं. उ. खा. ९/१९-२०)

Drugs of *elādi gaṇa* are best for *śamana, sarjarasda* mixed with ghee or oil for *mṛdu*, paste of drugs possessing *tīkṣna* properties for *recana*; the root of *kṣudra* and *marica* for *kāsaghna dhūma*; paste of skin, tendons and hoofs of animals for *vamana dhūma* and the powder of *nimba*, *vaca* etc. for *vraṇadhūpana*.

Dhūmapāna kalpanā for bālagraha

अन्येऽपि धूमा गेहेषु कर्तव्या रोगशान्तये ।।
मयूरपिच्छं निम्बस्य पत्राणि बृहतीफलम् । मरिचं हिङ्गु मांसी च बीजं कार्पाससंभवम् ।।
छागरोमाहिनिर्मोकं विष्ठा बैडलिकी तथा । गजदन्तश्च तच्चूर्णं किंचिद्धृतविमिश्रितम् ।।
गेहेषु भूपनं दत्तं सर्वान्बालग्रहाञ्जयेत् । पिशाचान्राक्षसाञ्जित्वा सर्वज्वरहरं भवेत् ।।
(शा. सं. उ. खा. ९/२१-२४)

Dhūma can also be done with many other substances as for example, the plumes of peacock, leaves of *nimba*, fruits of *bṛhatī*, *marica*, *hiṅgu*, *māṃsi*, seeds of *karpasa,* hairs of goat, the skinpeel of the snake, the excreta of cat, powder of elephants tusk or tooth – each one mixed with a little ghee. These fumes ward off all *bālagrahas*, *piśācas* and *rākṣasas* (germs and bacteria etc.) if allowed in to dwelling places and prevent all kinds of diseases.

Dhūmapāna Pascāt Karma

परिहारस्तु धूमेषु कार्यो रेचननस्यवत् । (शा. सं. उ. खा. ९/२५)

The after care of *dhūmapāna* is similar to those adopted for *recana nasya*.

Preparation of dhūmanetra

नेत्राणि धातुजान्याहुर्नलवंशादिजान्यपि । (शा. सं. उ. खा. ९/२५)

The tube can be made out of metals or reeds of bamboo.

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Method of Dhūmapāna

The *dhūmapāna* is to be taken when the person is sitting erect with attentive mind on the act. Generally inhalation is taken through the nose as follows: the patient is to close one nostrile and the other nostrile he should draw the smoke through the pipe three times consecutively. If the *doṣa* is situated in the nose, head and if it is *utkliṣṭa* i.e. moved from its seat, then the person should draw the smoke through the nostrile in the beginning. But if the *doṣa* is firmly lodged in the head or nose and is not moving; then he may take the smoke through the mouth. If the *doṣa* is situated in the throat then he should first take the smoke through nostriles and then through the mouth.

In all the cases, this inhaled smoke should be left off through the mouth and never through the nose, The smoke is to be drawn in and then left off and this process is repeated three timess on an occasion.

Yogya for Dhūmapāna

Dhūma is indicated between the ages of twelve and eighty years; it is advocated in diseases like *kāsa swāsa pratiśyāya* pain in the neck; lower jaw and head and diseases arising from *vāta* and *kapha*. Proper usage of *dhūma* confers clarity of sense faculties, speech and mind, firm teeth, mustaches and hairs and pleasant odour to the mouth.

Ayogya for dhūmapāna

The following persons are unsuitable for inhalation of smoke; the exhausted, the frieghtened, the sorrowful, those who have taken basti and *virecana* who have been awake all night, who are thirsty, feeling burning sensation in the throat or dryness of throat, those suffering from *udara, śirobhitāpa, timira, chardi, ādhmāna, urakṣata, prameha, pāṇḍuroga garbhiṇī, rūkṣa, kṣīṇa,* who have consumed milk, honey, ghee and alcoholic beverages; boiled rice, curd and fish; young children, old people and the weak.

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Chapter 27

VASTI KALPANĀ

As a matter of fact *Vasti* is the most important item among the *Samśodhana* procedures. *Vasti* enjoys the same significance in *Pañca Karma* therapy, as the *Pañca Karma* therapy itself mentioned in *Cikitsā* in general. The classical literature attaches a great significance to this form of treatment and points out a vivid scope of its applicability. However, the term *Vasti* is derived from the fact that the *Vasti Yantra* or the apparatus used for introducing the medicated materials is made up of *Vasti* or animal urinary bladder. Thus it is also described by *Suśruta* and through the rectum with the help of *vasti* (*Vasti Yantra* made up of animal urinary bladder) are designated as *Vasti*. Generally a *Vasti* is applied through the rectum though it may also be applied per urethra. In such cases the term *Uttara Vasti* is applied.

Depending upon the use of different drugs, *Vasti* effects *Samśodhana* of *doṣas*. It has also *Samśamana* effects. Thus *Vasti* in its different forms has also *Samśamana* effects. Thus *Vasti* in its different forms has a very wide application.

Though *Vasti* therapy has its scope in all kinds of ailments implicating different types of *Doṣas*, *Dūṣyas* and *Adhiṣṭhānas*; *Vasti* is supposed to be the principal (specific treatment for *Vātaja* diseases . *Vasti*, being the principal treatment for such an important factor, is considered the therapeutic procedure of maximum importance. This is why *Vasti* is said to be the half of the whole treatement and sometimes a complete treatment. This so wide scope of *Vasti* therapy is covered by varieties of *Vastis* that can be applied in different states. The following classification of *Vasti* may highlight this fact.

CLASSIFICATION OF *VASTI*

Anatomical classification

(a) *Pakwāśayagata* (Rectal) (b) *Garbhāśayagata* (Uterine)

(c) *Mūtrāśayagata* (Urethrovesical) (d) *Vraṇagata* (Wound/Abscess)

Pharmaceutical classification

(a) *Nirūha Vasti (Kaṣāya Pradhāna)*

(b) *Anuwāsana Vasti (Sneha Pradhāna)*

(i) *Sneha Vasti (ii) Mātrā Vasti (iii) Anuwāsana Vasti*

Pharmacological classification

According to Suśruta

(a) Śodhana Vasti (b) Lakhana Vasti

(c) Snehana Vasti (d) Brimhaṇa Vasti

According to Vāgabhaṭa

(a) Utkleṣana Vasti (b) Doṣahara

(c) Śamana Vasti

According to Śāraṅgadhara

(a) Utklesana *(b) Doṣahara*

(c) Śodhana *(d) Śamana*

(e) Lekhana *(f) Brimhaṇa*

(g) Picchila *(h) Deepana*

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According to Caraka

(a) Vātaghna Vasti *(b) Bala Varṇakṛt Vasti*

(c) Snehanīya Vasti *(d) Śukrakṛt Vasti*

(e) Kṛmighna Vasti *(f) Vṛṣatwa Kṛta Vasti*

According to the number of Vasti to be used

On the basis of the number of Vasti administered in a sequence the following terms are applied:

(a) ***Karma Vasti :*** where 30 *Vastis* are applied according to the schedule shown in Table A below.

(b) ***Kāla Vasti*** : Where 16 Vastis are applied as per schedule shown is Table B below.

(c) ***Yoga Vastis:*** Yoga Vastis are given in a sequence as per schedule shown in Table C.

(A) Schedule of Karma Vasti (18 S + 12 N = 30)

1S	2N	3S	4N	5S	6N
7S	8N	9S	10N	11S	12N
13S	14N	15S	16N	17S	18N
19S	20N	21S	22N	23S	24N
25S	26S	27S	28S	29S	30S

N = Nirūha Vasti

S = Sneha Vasti

(B) Schedule of *Kāla Vasti* (10 S + 6N = 16)

1S	2N	3S	4N
5S	6N	7S	8N
9S	10N	11S	12N
13S	14S	15S	16S

N = Nirūha Vasti

S = Sneha Vasti

(C) Schedule of Yoga Vasti (5 S + 3 N = 8)

1S	2N	3S	4N
5S	6N	7S	8N

N = Nirūha Vasti

S = Sneha Vasti

Classification according to the Nomenclature

(a) Yāpanā Vasti *(b) Siddha Vasti*

(c) Prasrita Yogikī Vasti *(d) Dwādaśa Prasritiki Vasti*

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(d) Pādahīna Vasti *(f) Tikṣaṇa Vasti*
(g) Mṛdu Vasti *(h) Picchā Vasti*
(i) Rakta Vasti.

Basically the *Vasti* may be of two types: 1. *Anuvāsana Vasti*, 2. *Nirūha Vasti*. The *Anuvāsana Vasti* predominently consists of *sneha* substances, while a *Nirūha Vasti* consists mainly of *Kaṣāyas* or decoctions of appropriate drugs. In most of the occasions a combination of both these types of *Vastis* is given except for fever specific indications where one may have to adopt the single or continued use of one or the other type of these two *Vastis*. However, the general indications and contra indications of *Vasti* therapy are as follows:

Indications of Āsthapana vasti

1. Sarwānga roga *2. Ekānga roga*
3. Kukṣi roga *4. Vātasanga*
5. Mūtrasanga *6. Malasanga*
7. Śukrasanga *8. Balakṣaya*
9. Māmsaksaya *10. Doṣa Kṣaya*
11. Śukra kṣaya *12. Ādhmāna*
13. Angasupti *14. Kṛmikoṣṭa*
15. Udāvarta *16. Śuddhātisāra*
17. Pārśwa bheda *18. Abhitāpa*
19. Plīhadoṣa *20. Gulma*
21. Śūla *22. Hṛdroga*
23. Bhagandara *24. Unmāda*
25. Jwara *26. Bradhna*
27. Śirah-śūla *28. Karṇa śūla*
29. Hṛdaya śūla *30. Pārswa śūla*
31. Pṛṣtha- śūla *32. Kaṭi-śūla*
33. Kampa *34. Ākṣepa*
35. Anga Gourawa *36. Atilāghawa*
37. Rājayakṣmā *38. Viṣamāgni*
39. Sphigaśūla *40. Jānuśūla*
41. Jāngha śūla *42. Uruśūla*
43. Gulpha śūla *44. Pārśwa śūla*
45. Prepāda śūla *46. Yoni śūla*
47. Bāhu śūla *48. Anguli śūla*
49. Stana śūla *50. Nakha śūla*
51. Pārśwa-asthi-śūla *52. Danta śūla*
53. Śopha *54. Stambha*
55. Āntra-kūjana *56. Parikartikā*
57. Vāta Vyādhi *58. Jwara*
59. Timira *60. Pratiśyāya*
61. Adhimantha *62. Ardita*

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63. Pakṣāghāta
64. Aśmarī
65. Upadamśa
66. Vāta Rakta
67. Arśa
68. Stanya Kṣaya
69. Manyāgraha
70. Hanugraha
71. Mūḍha Garbha
72. Mūtrakṛcchra.

Contraindications of Āsthāpana Vasti

1. Ajīrṇa
2. Atisneha
3. Pītasneha
4. Utkliṣṭa Doṣas
5. Alpāgni
6. Yānaklānta
7. Atidurbala
8. Kṣudhārta
9. Tṛṣṇārta
10. Śramārta
11. Atikṛśa
12. Bhuktabhakta
13. Pītodaka
14. Vāmita
15. Virikta
16. Kṛtanasyakarma
17. Kruddha
18. Bhīta
19. Matta
20. Mūrcchita
21. Chardi Prasakta
22. Niṣṭhīwana Prasakta
23. Śwāsa prasakta
24. Kāsa Prasakta
25. Hikkā- Prasakta
26. Baddha Gudodara
27. Chidrodara
28. Dakodara
29. Ādhmāna
30. Alasaka
31. Visūcikā
32. Āmadoṣa
33. Āmātisāra
34. Prameha
35. Kuṣṭha
36. Arśa
37. Pāṇḍu
38. Bhrama
39. Arocaka
40. Unmāda
41. Śokagrasta
42. Sthoulya
43. Kanṭhaśoṣa
44. Kṣatakṣīna
45. Garbiṇī
46. Bāla, Vṛddha
47. Gudaśotha
48. Alpavarca
49. Āmaprajāta
50. Śopha

Indications of anuvāsana vasti

Following are the indications for *Anuvāsana Vasti* in addition to those which are already mentioned under the indications for *Āsthāpana Vasti* :

1. Viśeṣa Rūkṣa
2. Tikṣṇāgni
3. Vāta Vyādhi.

Contraindications of anuvāsana vasti

1. Anāsthāpya
2. Abhukta Bhakta
3. Nava jwara
4. Pāṇḍu

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5. *Kāmalā* 6. *Prameha*
7. *Arśa* 8. *Pratiśyāya*
9. *Arocaka* 10. *Mandāgni*
11. *Durbala* 12. *Plīhodara*
13. *Kaphodara* 14. *Urustambha*
15. *Atisāra* 16. *Viṣapīta*
17. *Garapīta* 18. *Kaphaviṣyandi*
19. *Gurukoṣṭha* 20 *Ślīpada*
21. *Galaganḍa* 22. *Apaci*
23. *Kṛmikoṣṭhī* 24. *Prameha*
25. *Kuṣṭha* 26. *Sthoulya*
27. *Pīnasa* 28. *Kṛśa.*

Procedure of Vastikarma

The following factors need consideration in reference to *Vasti Karma* similar to any other procedure are :

1. *Doṣa* 2. *Auṣadhi*
3. *Deśa* 4. *Kāla*
5. *Sātmya* 6. *Agni*
7. *Satwa* 8. *Oka*
9. *Vaya* 10. *Bala.*

Doṣas : As mentioned earlier *Vasti* is the specific therapy for *Vāta Doṣa*, though it is also helpful in the management of disorders of *Pitta* and *Kapha Doṣas*.

Āuṣadhis (Drugs) : The consideration of drugs therapy is again important. Among many factors the following 11 factors (*Ekādaśa Auṣadhi Doṣa*) as described by *Śusrūta* and *Caraka* are of special significance.

1. *Āmata* 2. *Hīnatā*
3. *Atimātrā* 4. *Determination of Nirūha Mātrā according to age*
5. *Ati-tikṣṇa causing Dāha, Atisāra, Mūrcchā* 6. *Ati – Mṛdu causing Vibandha, Ādhmāna*
7. *Ati-Snigdha causing Jāḍya* 8. *Ati- Rūkṣa causing Vāta Doṣa*
9. *Ati- Sāndra* 10. *Ati- Drawatā*

There are several drugs indicated for use in *vastikarma*. They include *sthāvara- vanaspatika dravyas, jāngama kṣīra, māṁsa-rasa, vīrya, eggs, urine, kṣāra, lavaṇa* etc. There are very few *dravyas* which are not indicated for *vasti- karma*. Hence it is not possible to give the detailed description of each drug.

Caraka

The names of the groups of vasti- dravyas are being enumerated here :

1. *Phalini-auṣadhiyana* 2. *Sneha- dravyas*
3. *Mūtra-varga* 4. *Āsthāpana and anuvāsana-gaṇa*
5. *Asthāpanopaga-gaṇa* 6. *Anuvāsanopaga-gaṇa*
7. *Shadosthaj anaskandha*

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(a) *Madhura skandha* (b) *Āmla skandha*
(c) *Lavaṇa-skandha* (d) *Kaṭuka–skandha*
(e) *Tikta-skandha* (f) *Kasāya-skandha.*

Suśruta : (1) *Nirūha-varga.*

Vāgbhata : (1) *Nirūhopayogi- gaṇa.*

Drugs Commonly used for Vasti Kalpa Purpose

As it is mentioned that, vasti is having broad spectrum of effect over the body hence drugs used for this purpose also having wide range. They are *stāvara, vanaspatika, jangama (Kṣīra, Māṁsarasa, mūtra)* and *kṣāra lavaṇa,* etc.

Commonly used drugs for both āsthāpana and anuvāsana vasti purpose:

1. *Pāṭala* 2. *Agnimantha*
3. *Bilva* 4. *Śyoṇāka*
5. *Kaṣmiri* 6. *Śāliparni*
7. *Prusniparni* 8. *Bruhati*
9. *Kaṇṭakāri* 10. *Gokṣūra*
11. *Bala* 12. *Eraṇḍa*
13. *Yava* 14. *Kulutha*
15. *Guḍūci* 16. *Madanaphala*
17. *Kola* 18. *Palāsa*
19. *Sneha* 20. *Lavaṇa etc.*

Common drugs used for Anuvāsana Kalpanā (Anuvāsnopagaṇa)

1. *Rāsna* 2. *Bilva*
3. *Śatapuṣpa* 4. *Devadāru*
5. *Madanaophala* 6. *Raktapunarnava*
7. *Agnimantha* 8. *Gokṣūra*
9. *Swetapunarnava* 10. *Śyoṇāka.*

Common Formulations meant for Anuvāsana vasti

1. *Daśamūlādi taila* used for *Vātavyādhi* treatment.
2. *Guḍūcyādi taila* used for *Vātavyādhi* treatment.
3. *Satāhwādi taila* used for *Vātavyādhi* treatment.
4. *Jīvantyādi yamaka* : It is *bṛmhaṇa* and is indicated for *Vātapittavyādhies, mūtradoṣa, śukradoṣa, arthavadoṣa.*
5. *Saiṇdhavādi taila* is indicated for *Kaphaja vyādhies.*
6. *Viḍangādi taila for tridoṣa śāmaka, ojovriddikaram, śukravriddikaram* and commonly indicated for *vātaprameha, kṛmi koṣṭa, grahaṇi.*
7. *Kṣīrabala taila* is indicated for *vātavyādhi.*
8. *Balāśwagandha taila* is *bhṛmhaṇam, rasāyana* and indicated for *vātapittavyādhies.*

Acāryas also mentioned *Sahacarādi taila, Nārayaṇa taila, Dhanvantari taila* and *ghṛta* with *saindhavalavaṇa* can be given according to requirement.

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Common drugs used for Āsthapana Vasti Kalpanā (Āsthāpanopaga gaṇa).

1. Trivrith, 2. Bilwa, 3. Pippali, 4. Kuṣṭa, 5. Sarṣapa, 6. Vaca, 7. Kuṭajaphala, 8. Śatapuṣpa 9. Yaṣṭimadhu, 10. Madhanaphala.

Common formulations meant for āsthāpana vasti

Formulations to be used for vātarogas

1. Four parts of *daśamūla kwātha* and one part of *eranda taila*.

2. *Kwātha* is prepared with *yava, kulutha, badara, śāliparni* is mixed with *catursneha (Ghṛta, taila, vasa, majja)* and *maṁsa rasa* then made into *vasti* form.

Formulations is to be used for Kapharogas

1. *Kwātha* is prepared with *arka mūla, alarka, pāṭha, punarnava* is given in *vasti* form.

2. *Kwātha* is prepared with *pippali, citraka* and mixed with *kṣāra, gomūtra, madhu* and made into *vasti* form.

3. *Aragwadādhi gaṇa kaṣāya* is given in *vasti* form.

***Deśa (Climate)* :** *Deśa* includes the consideration of *Bhūmi Deśa* (climate as well as the *Āturadeśa* (patients body constitution).

***Kāla and Kālāwadhi* :** According to *Hārīta, vasti* should be given in *Kṛṣṇa pakṣa* while according to *Jaijjaṭa, vasti* is indicated in *Śukla Pakṣa*.

***Sātmya (Adaptability)* :** *Nirūha vasti* should always be given on empty stomach when food is fully digested. Because *Nirūha Vasti* given after meals on full stomach causes *Chardi* and *Visūcikā*.

***Agni (Digestive capacity)* :** In *Manmdāgni Puruṣa, Nirūha vasti* is contraindicated.

***Satwa (Mind)* :** Type of dosage schedule of *Vasti* should be determined in consideration with the *Pravara, Madhya*, and *Awara Satwas*.

***Oka Sātmya* :** This is to signify the consideration of adaptations developed by habbit or repeated experiences.

***Vaya (Age)* :** Age is the most important factor to be considered according to dose as well as the nature of Vasti and the size of *Vasti Yantra*.

***Bala(Strength)*:** *Bala* of the patients *(Sahaja, Yukti Kṛta, Kāla Kṛta)* should again be considered in reference to the selection and procedure of *Vasti* Therapy.

Procedure of Vasti

1. Patient's posture: Left lateral position with left lower extremity straight and right lower extremity flexed on knee and hip joint.
2. Oleation of Anus: *Jātyādi* or *Padmakādi taila* are applied locally in *Gudamārga* and in *Vasti* also.
3. The patient is asked to take deep breath while the *Vasti* and *Vasti-Auṣadhi* are introduced.
4. Shivering of the hands be avoided as it may produce *Guda Kṣata* or anal injury.
5. Quicker insertion of *Vasti* be avoided.
6. Too slow induction of *Vasti* be also avoided.
7. Opening of the *Vasti-Netra* should be kept straight .

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8. The total *Vasti* drug should not be introduced in the *Pakwāśaya* in order to avoid entrance of *Vāyu* into the *Pakwāśaya* which may produced pain.

9. *Vasti* tube should be immediately pulled out after introduction of the drugs.

10. Patient should remain lying in the same (Left) lateral posture upto half minute after introduction of *Vasti*.

11. After that the patient should take up *Utkaṭukāsana* to eliminate the *Mala Vegas*.

Vasti Pratyāgama kāla

Duration of elimination of *Vasti* is known as *Pratyāgama Kāla*. The time of *Pratyāgma Kāla* is one *Muhūrta* (48 minutes). If *Vasti* does not come out within one *Muhūrta*, the patient may die or may get severe pain *(Vāgbhaṭṭa)*. If *Vasti* is retained for more that a *Muhūrta* (48 minutes) the following complications occur:

(a) Koṣṭha Ādhmāna, (b) Pakwāśaya Śūla, (c) Mūtra Śūla, (d) Vāta Pratilomana, (e) Pressing pain in cardiac region, (f) Others according to Suśruta

(i) Vāta-Pratilomana (ii) Viṣṭambha (iii) Śūla (iv) Jwara (v) Arati (vi) Death.

Features of samyak(Adequate) Vasti

1. Prasriṣṭa Viṭakatā, 2. Prasriṣṭa Mūtratā, 3. Prasriṣṭa Vātatā, 4. Mala, Pitta, Kapha, Vāta, Visarjana Yadhākrameṇa, 5. Lāghawa, 6. Ruci, 7. Agni tīkṣṇatā, 8. Rogopaśamana, 9. Prakṛtisthatā 10. Bala Vardhana.

Features of asamyak (Inadequate) vasti

1. Rujā, 2. Śotha, 3. Pratiśyāya, 4. Kartikā, 5. Hrillāsa, 6. Vātasanga, 7. Mūtra sanga, 8. Śwāsa kṛcchratā, 9. Aruci, 10. Vegālpatā, 11. Jāḍyatā.

Features of excess vasti (Atiyoga)

1. Angasupti, 2. Angamarda, 3. Klama 4. Nidrā 5. Kampa, 6. Dourbalya, 7. Tamaḥ Praveśa, 8. Unmāda, 9. Hikkā.

Post-vasti regimen

1. Pathya : 1. *Sukhoṣṇa Jala* (Warm water)

ii. *Milk, Yūṣa, Māṁsa rasa* according to the *Doṣic* setup (*Vāta, Pitta, Kapha*) and *Balānusāra* (Strength of the patient)

iii. *Suśruta* describes the following schedule.

S.No.	*Doṣa*	*Pathya*
1.	*Vāta Doṣa*	*Māṁsa Rasa*
2.	*Pitta Doṣa*	*Dugdha*
3.	*Kapha Doṣa*	*Yūṣa*

iv. *Vāgbhaṭṭa* emphasizes *Sukhoṣṇa Jala* as a *post-Vasti* Pathya.

v. Diet should not be *Guru*. Light diet should be followed by *Anuvāsana Vasti* in the evening.

Following activities should be avoided after Vasti Karma

1. Avoid sitting posture for long duration.

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2. Avoid standing posture for long duration
3. Avoid excessive talking
4. Avoid travelling
5. Avoid day sleeping
6. Avoid coitus
7. Avoid *Vegāvidhāraṇa* (suppression of urges)
8. Avoid *Śītopacāra* (exposure to cold)
9. Avoid sunlight
10. Avoid *Śoka* (anxiety)
11. Avoid *Krodha* (Anger)
12. Avoid *Akāla āhāra* (unitimely meals)
13. Avoid *Ahita āhāra* (incompatible diet)

Vasti vyāpada (complications)

A. Complications due to *Vasti Netra*

B. Complications due to *Vasti Puṭaka*

C. Complications due to *Vasti Dātā*

Complications due to Vasti Puṭaka

Sl.No.	Vasti	Complications
1.	*Viṣama Vasti*	*Gati Vaiṣamya*
2.	*Māṃsala Vasti*	*Visragandhatā*
3.	*Chidrayukta Vasti*	*Vāhytaḥ Srāwa*
4.	*Sthūla Vasti*	*Pain*
5.	*Jalavatī Vasti*	*Drava Srāwa*
6.	*Vātala Vasti*	*Phenila Srāwa*
7.	*Atisnigdha Vasti*	*Pain*
8.	*Atiklinna Vasti*	*Hardly catchable*

Complications due to vasti dātā :

1. *Savāta Vasti Dāna* (Entrance of air through *Vasti*)
2. *Druta Prāṇita* (Quickly Administered *Vasti*)
3. *Tiryaka Praṇidhāna* (Tilted administered *Vasti*)
4. *Ullipta* (repeatedly pushed *Vasti Puṭaka* where *Vāta* goes inside and produces complications).
5. *Sakampa Vasti Dāna* : Shivering administration of *Vāsti* produces *Śotha, Dāha*, etc.
6. *Atiprāṇita Vasti:* Complication due to excessive entrance of *Vasti* Viz., pain, burning sensation.
7. *Ati Vāhya Dattā Vasti*: Complication due to less entrance of Vasti.
8. Ati Manda Datta Vasti: Too slowly given *Vasti*.
9. *Ati Vega Dattā Vasti*: Complications due to forcibly administered *Vasti*.

MODERN ASPECT OF ENEMA

Enemas are aquoeus or oily solutions or suspensions intended for introduction in to the rectum for

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their purgative, sedative, anthelmintic, anti-inflamatory or nutritive effects. They may also be used for X-ray examination of the lower bowel. Among the commonly used drugs in solution form which act as cleansing enemas include isotonic solution of sodium chloride, sodium bicarbonate, 2% sodium phosphate , magnesium sulphate, soap, glycerin and a combination of these substances. The other drugs used in the form of enemas include olive oil, arachis oil, chloral hydrate, paraldehyde, turpentine, alum, tannic acid and barium sulphate etc.

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Chapter 28
AUṢADHA VITARAṆĀ

Pharmaceutical Marketing

Management process of any organization is based on five Ms i.e. men, money, materials, machines and markets. Marketing is the last and most important part in the organization of a business unit. The success of any business organization depends not only on the production but on the successful selling of the produced articles.

Marketing may be defined as the process by which the products are made available to the ultimate consumers from their point of origin at a reasonable profit. This involves the movement of goods from the manufacturers to the ultimate consumers.

The process of pharmaceutical marketing is quite similar to that of general marketing and both of them are based on the same principles. However the pharmaceutical marketing differs from general marketing that:

i) In the case of pharmaceutical products the selection of a product is not in the hands of the consumer but it is in the hands of a physician or a doctor. A consumer will have to by the same products what-so-ever have been prescribed by the physician whereas in the case of general articles a consumer can buy any product of his own choice.

ii) A drug differs from general items that the use of a right drug may cure the disease and save a life but the use of a wrong drug may lead to various complications even with loss of life. Therefore the selling of pharmaceuticals is very important and must be carried out very carefully by or under the supervision of a qualified person.

iii) For pharmaceutical marketing a drug licence is required.

iv) Misuse and self medication of drugs may prove very harmful therefore advertisement of drugs is prohibited.

The concept of marketing has changed to a great extent. It is no longer considered simply as 'selling'. Now a days there is a large scale production of all items and great competition among the manufacturers therefore the concept of marketing has altogether changed. Markets are no longer local but have become national and international in character.

Marketing functions

The goods produced by a manufacturer has to travel a long journey and has to pass through many operations and many hands till it reaches to the ultimate consumers. All the various activities and operations involved are refereed to as marketing functions which are as follow:

1. Buying
2. Selling
3. Transportation
4. Storage
5. Grading and standardization
6. Financing
7. Risk bearing
8. Feed back information.

Buying

Basically the word buying not only involves purchasing of goods but involves the entire purchase procedure i.e.

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1. Assessing total material requirement.

2. Deciding the economic order quantity i.e. the optimum number of units or quantity that must be purchased under one order.

3. Market surveying i.e. to find out the best sources of supply and at reasonable cost.

4. Calling for quotations and tenders.

5. Placing the order for the required quantity on the basis of quotations or tenders according to the terms and conditions laid therein.

6. Receiving the goods and inspection there of both quantity and quality wise.

7. Sending the goods to store.

8. Checking the bill and making the payment.

Modes of Purchasing

i) By inspection ii) By sample

iii) By description iv) By grading.

Selling

Selling is the most important and the ultimate aim of any business. In fact it is the heart of marketing because nothing happens unless somebody sells something. Selling is the process of finding the customers, creating demand by various sales promotion schemes and finally transferring the goods for value or money.

Sale does not mean mere delivery of goods but it implies (means) transfer of ownership of goods from the seller to the buyer and risk has passed to the buyer. Selling brings buyers and sellers together. Selling is of utmost importance for future planning and provides basis for future production.

At the same time selling is also the most difficult and chanllenging apart of entire business activities because to survive for a long period in the market it is necessary that the seller will have to establish bonafides and this can be done only by complete satisfaction of the customers.

Transportation

Transporation is the process of carrying goods and persons from one place to another. It is concerned with carrying the goods from the places of production to the places of their consumption and in the process it widens the market for goods and specializations of production.

Storage (Warehousing)

Storage is the process of keeping, holding and preserving the goods which are to be used at a later stage. When this process is done at a large scale and in a specialized manner it is termed as warehousing. The basic idea of storage is to keep the goods in proper conditions, to make the goods available as and when required and to ensure continuous and unrestricted supply of goods in the market.

Need and Importance of Storage

1. Now a days the goods are not continuously produced. All the goods are not immediately sold so the unsold goods will have to be stored.
2. Storage of raw materials is necessary to ensure unintrupted production.
3. Many drugs are use in a particular season but they are produced throughout the year so they will have to be stored for sale as and when required.

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4. Storage is necessary to take the advantage of bulk buying.
5. It is done in anticipation of demand.
6. Certain goods which can get higher prices in future are stored for a longer period. For this purpose perishable goods like fruits, vegetables, etc. can be storeed in cold storage.
7. Storage is necessary for wholesalers as well as retailers for regular supply to the consumers.

Functions of storage

Protection of Goods

The primary function of storage is to protect and preserve the goods against damage due to rain, pest, insects, dust, fire, sun and theft etc.

Price Stability

Another function of storage is to maintain price stability by retaining the goods when their production is more and relaeasing them when their demand is more.

Loan Facility

Loans can be raised from banks and other financial institutions by keeping the warehouse receipts as a security.

Grading and Packing Facilities

Now-a-days warehouses provide various facilities of packing, processing and grading of goods. They can be packed in convenient sizes as desired by the owners.

Grading

Grading in simple words means the classification of goods into well defined untits possesssing similar characteristics of size, colour, shape etc. All types of articles like fruits, vegetables, clothes, eggs etc. are devided into different grades according to their quality.

Branding

Branding may be defined as an act of affixing a name, term, symbol, or a design to the product in order to distinguish it from the products of other sellers or competitors. Extensive advertisement and large scale selling is not possible without giving brand name to a product.

Financing

Finance or capital is the life blood of any business. Without finance it is not possible to run any marketing activity. A large amount of money is required for the production and marketing of goods and servicing. Finance is needed for the purchases of machinery, raw materials, carrying production operations, meeting transportation, storage and insurance expenses. The wholesalers and retailers also need finance for purchasing, storing, giving credit to their customers and for meeting day to day expenses.

The finance can be raised from own sources, commercial banks,shares,debentures, financial institutions, trade creditors etc.

Risk Bearing

In marketing process many kinds of risks are involved at every stage. From the time of production to the time of disbursement of goods to the actual consumer they are exposed to may risks on account of unavoidable circumstances e.g. fire, accidents.

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Feed-back Information

Feed-back Information means collecting the vital information regarding what type of goods are needed by the customers, where they are needed and how much quantity is needed, what is the market trend and present level of competition of other suppliers.

Channels of distribution

The channel of distribution is the last component of the total marketing process. The ultimate aim of every producer is to get the goods delivered to the consumers. Channels of distribution generally compose of wholesalers and retailers and sometimes through agents. The goods are very rarely distributed direct from the manufacturer to the consumers.

Advertisement of Pharmaceutical Products

The advertisement of consumer goods and pharmaceutical products is quite different from each other because the former are made directly to the consumers whereas the later are addressed to the doctors or physicians who is the deciding person for the selection of a particular medicine for a particular patient and not the patient himself. Similarly the chemist or pharmacist cannot dispense the medicines of his own choice, he will have to dispense only those medicines which are prescribed by the doctor, physician or R.M. P. This is because the drugs and medicines, due to their potencies and toxicities require lot of discretion and judgement in their use which can only be provided by an authorized expert medical person. The direct advertisement of drugs to the public may lead to self medication with very serious results. Due to these reasons the direct advertisement of drugs to public is prohibited. However the advertisement of cosmetics and household remedies can be done for which the above mentioned advertising media may be adopted.

If any one contravenes the rule and indulges in prohibited advertisements may be prosecuted and imprisoned upto six months or fine or both on first conviction which may extend upto one year imprisonment or fine or both on any subsequent conviction.

Materials Management

The term materials management is concerned with the determination of policy regarding procurement of materials as regarding to quality, quantity and price etc. and disbursements of the same to different production department as and when required .

All the pharmaceutical manufacturing industries and other organizations procure raw materials, components and new plant machinery etc. They are purchased, stored and stocked either for immediate or future use. The major investment of any company is on the raw materials and machinery etc. Which ranges from 50 to 85%, depending on industry to industry. The cost of materials directly affects the cost of production and ultimately the profit of the organization. Therefore material management is very important for the economic success of any pharmaceutical company.

Book Keeping and accountancy

When a person starts any business, large or small, his main aim is to earn money. He purchases the goods at certain prices and sells them at higher prices. Thus the difference in the purchase price and sale price is his profit.

Accountancy may be defined as the language of communicating business transactions and finance information about the business. It is an art of recording the business transactions in the books of acccounts in a systematic and scientific manner so as to show a true and fair picture of the business on any particualar day and to keep a permanent record of business transactions.

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Financial Planning

Finance is the life –blood of any business, big or small. It's necessity is felt at all levels in the business organizations . No activity in the business can be carried out without finance. For a pharmaceutical organization finance is required for the following purposes.

1. To acquire land, buildings, machinery and equipment.
2. To purchase raw materials and other necessary items.
3. To pay wages, salaries and other incidental charges etc.
4. To pay rent, insurance, taxes and advertising charges etc.
5. To maintain a regular supply of the products in the market.
6. To allow credit to the wholesalers and other user departments.

Financial Management

Financial management is one of the most important function of pharmaceutical management because the success of any company greatly depends on the acquisition and proper utilisation of financial resources. For the proper handling of finance it is necessary that the organizations should have a well trained and experienced financial manager who will look after all the financial activities including raising of sufficient funds, budgeting, lending and borrowing policies and management of fixed and current assests. If proper financial management techniques are used the pharmaceutical companies can reduce, their capital employed and improve their return on investments in men and machines.

Financial Planning

Financial planning may be defined as the process of deciding in advance the financial activities necessary for a pharmaceutical company to achieve its basic objectives.

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Chapter 29
STANDARDISATION

The need for the quality control methods for the *Āyurvedic drugs*, the drugs prepared according to the ancient Indian system of medicine is left due to the commercialization of the Ayurvedic Pharmacy during the current century and also due to the inclusion of the *Āyurvedic drugs* under the drugs and cosmetic act.

It is a difficult task because majority of the *Āyurvedic formulations* are complex materials of natural origin. It seems difficult to locate and isolate a single active ingredient and probably the formulation as a whole is responsible for its activity. It should still be possible to evolve some simple, quality control methods on the identification of structure of a single active molecule.

Standardisation of crude drugs

Standardisation of crude drugs is a laborious effort because of many factors which directly influence the quality and purity of crude drugs. The present status of standardisation techniques practised in different *Āyurveda* drug manufacturing firms are not competent enough to establish a unique standarrdisation system for crude drugs. The experience in handling crude drugs is much more counted than any other form of standardisation techniques. Most of the *Āyurvedic* drug manufacturing industries concerned with the production of conventional poducts are mainly depend on the practical experience of drug collectors and working people who have acquired a long term experience in handling the crude drugs. Moreover the drug manufacturing industries also give some authentication regarding to quality of crude drugs to some persons or firms in the light of their long term experience in the field. But this will not give a total profile regarding the quality and purity of drugs.

The experience of these persons are totally depends on the organoleptic character of the crude drugs without considering any other criteria for assuring the quality and purity. The therapeutic activity of a crude drug exclusively depends on the presence of active ingredients and their concentration. The development of active ingredients in a crude drug depends on the interaction of environmental and ecological factors. So without giving utmost importance to these factors, the determination of quality and purity of a crude drug by organoleptic consideration will not reveal the total profile of a crude drug.

Majority of *Āyurvedic* medicines are compound formulations containing a large number of crude drugs. Being natural products each drug contains a large number of chemical constituents in different concentrations. So we cannot imaging the interaction between these chemical constituents present in a compound drug formulation. Moreover it is almost impossible to check the presence of a specific ingredient in the finished product. The therapeutic effect produced by a drug combination is not always specfic but supportive also. So the therapeutic effect of a drug formulation is not restricted to a specific or a group because the effect produced is the total effects of the formulation by the rational combination.

To maintain the therapeutic effect of a formulation, the quality and purity of the ingredients are to be maintained. So the standardisation of a medicine begins from the selection of crude drugs itself. To establish an effective standardisation system, every *Āyurvedic* manufacturing industry should maintain a collection of crude drugs which are properly standardised. Samples collected from market are compaired to standard collection maintained by the industry to check quality and purity of crude drugs purchased and thus improving the qualityof *Āyurvedic medicines*.

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Standard

The standard is numerical value which quantify the parameter and thus denots quality and purity of a material. The numerical value expressed in various metric units of measurements actually gives the quantitative value of the parameter which is used for making the standard. The criteria or the parameter which is considered for making the standard is intimately related to the factor which is responsible for the expected quality and purity of the material. So generally the acceptablity of a material is always established by prescribing a standard.

In the case of a synthetic drug the quality and purity depends on the most of biologically active chemical ingredient present in it which is capable of producing the therapeutic effect in the expected level. So the criteria taken for the standardisation of a synthetic drug is the amount of the specific chemical substance.

But this procedure is not always true with nautral drugs. The natural drugs are derived from plant, animal and mineral sources. In *Āyurveda* majority of natural drugs are of plant origin. Natural drugs are more complex than synthetic drugs in their chemical structure and composition. Different plant parts such as roots, seeds, flowers, stem, bark, wood , leaves and the plant as a whole are used as medicine. The medicinal property of the crude drug is due to the biologically active chemical constituents. The development of these chemical contituents is greatly influenced by different environmental and ecological factors.

In *Āyurveda*, the therapeutic effect produced by a crude drug is not always attributed to a single chemical substance. Moreover the different therapeutic dosage forms are not concerned with pure isolation of active constituents. The therapeutic effect produced by an *Āyurvedic* dosage form is always multidimensional i.e. the main therapeutic effect is always accompanied by some supportive effects also.

The efficacy of a drug combination depends on the purity, chemical nature, potency, rate of absorbtion, metaboilic transformation and elimination. Different pre and therapeutic processing procedures of the various dosage are indicated for maintaining the purity, to increase th potency, easy metabolic transformation and elimination.

Standardisation-A Multi-Dimensional Approach

Standardisation of crude drugs is not an easy procedure because almost all crude drugs are of natural origin. In the case of a natural drug, the therapeutic efficacy is a total effect of its chemical constituents. So the quantity and purity refers to the total profile of the drug rather than any of its character. So a multi-dimensional approach is essential for standardising a crude drug. Then only the total profile of a crude drug is established.

For the purpose of the above, all the aspects of crude drug are to be considered in detail. This multidimenhsional approach should cover every minute aspect of the crude drug specifically the name, botanical source, geographical source, organo-leptic, morphological, anatomical, physical, chemical, biological and relevent references from the classical texts-are to be considered in detail. The classical references denote the various morphological, chemical, physical and therapeutic importance of the drug along with its origin and other organoleptic characters. In short the multi-dimensional approach is the only way by which the standard of a crud drug is to be established.

Selection of Parameters

The standarisation of crude drug is a multi-dimensional approach, various parameters regarding

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different characters to be considered. The selection of parameters depends on various aspects of the crude drug.

1. Name
   a. Botanical b. Regional
2. Synonyms
3. History and Introduction
4. Classical reference :
   a. Rasa *b. Guṇa*
   c. Vīrya *d. Vipāka*
   e. Prabhāva *f. Karma*
5. Sources
   a. Botanical b. Geographical
6. Organo- leptic
7. Anatomical
8. Physical
9. Chemical
10. Biological
11. Adulteration trends
12. Varities
    a. Natural b. Commercial

Guidelines to be followed in the use of the standards

The tests and specifications prescribed are not claimed to be exhaustive. Depending on the nature of the sample under examination, the analysis not precluded from using additional tests for determining quality or purity.

In cases where the prescribed method is not applicable . alternate methods may be used provided they are authoritative.

The method of preparation of a sample for test or assay is important. The analyst is not precluded from using other methods of equal accuracy.

General considerations applicable to accuracy of results must always be kept in mind. Any deviations in the quantities of a sample used for tests/assays must be without prejudice to accuracy. In gravimetric determinations, these quantities should be such that the weight of the final precipitate should be o.1 g. In volumetric determinations, they should be such that volume of not less than 5 ml. of the titrant (decinormal strength) is required for titration, as far as possible.

Determination of pH

(Āsavas, ariṣṭas, arka, drāvaka, avaleha, kṣāra, lavaṇa)

The pH value of an aqueous liquid may be defined as the common logarithm of the reciprocal of the hydrogen ion concentration expressed in grammes.

The pH value of a liquid is determined potentiometrically by means of a glass electrode and a suitable pH meter.

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Method

Operate the pH meter and electrode system according to the manufacture's instructions.

Standardise the meter and electrodes, if necessary, with *M/20 Potassium hydrogenpthalate (pH 4.00)* when measuring an alkaline solution.

Preparation of test solution

(Āsava, ariṣṭa, arka and drāvaka)

The sample may be used as such, filtered through a dry filter, if necessary.

Avaleha : A 10 percent w/v suspension in water thoroughly mixed is centrifuged and the supernatant liquid is used.

Kṣāra and Lavaṇa : A 10 percent w/v solution in water, filtered through a dry filter, is used.

Determination of Refractive Index

(Ghṛta, taila, pāka)

The refractive index(n) of a substance is the ratio of the velocity of light in a vaccum to its velocity in the substance. It varies with the wave length of the light used in the measurement.

It may also be defined as the ratio of the sine of the angle of incidence to the sine of the angle of refraction.

Refractive indices are stated in terms of sodium light of wave length 9893 A at a temperature of 20 °C unless otherwise specified.

Refractometers

Commercial instruments are normally constructed for use with white light but are calibrated to give the refractive index in terms of the sodium D wave length.

The maker's instructions relating to a suitable light source should be followed.

Temperature Control : A suitable device should be used for circulating water at the required temperature through the refractometer.

Preparation of sample

Ghṛta, pāka : The fat is extracted from an aliquot of the sample in a continuous extraction apparatus using light petroleum as solvent. The extract is filtered , the solvent is completely removed by distillation/evaporation and the residual fat is used.

Taila : The sample is filtered through a dry filter.

Procedure : Circulate water through the instrument at the required temperature. Place a drop of the liquid between the prisms, and take the reading after half a minute.

Specific gravity

(Ariṣṭas, āsavas,drāvakas)

The specific gravity of a liquid is the weight of given volume of the liquid at the specific temperature compared with the weight of an equal volume of water at the same temperature, all weighings being taken in air.

Procedure

A pycnometer of 25 ml. capacity is cleaned, dried and weighed. It is filled upto the mark with at the required temperature and weighed. The pycnometer is next filled up to the mark with the sample, fil-

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tered if necessary, at the same temperature and weighed. The specific gravity is determined by dividing the weight of the smple expressed in grammes by the weight of the water, expressed in grammes.

Determination of fineness of particles

(Lepa, bhasma, sindūra, piṣṭi, cūrṇa)

The degree of coarseness of fineness of a powder is differentiated and expressed by the size of the mesh of the sieve through which the particle is able to pass .

The following terms are used in the description of powders.

Coarse powder (10/44)) A powder of which all the particles pass through a *No. 10 sieve* and not mre than 40.0 percent through *No. 44 Sieve.*

Moderately coarse powder (22/60) A powder of which all the particles pass through a No. 22 sieve and not more than 40.0 percent through a *No. 60 sieve.*

Moderately fine powder (44/85) a powder of which all the particles pass through a *No. 44 sieve* and not more than 40.0 percent through a *No. 85 sieve.*

Fine Powder (85) A powder of which all the particles pass through a *No. 85 sieve.*

Very fine powder : A powder of which all the particles pass through a silk sieve in which not less than 120 meshes are include in a length of 2.54 cm. in each transverse direction parallel to the threads.

Sieve : The wire sieves used in sifting powdered durgs are distinguished by numbers which indicate the number of meshes included in length of 2.54 cm. in each transverse direction parallel to the wires.

Procedure : A suitable quantity of the sample is weighed and transferred to the set of sieves from No.10 to No. 85. The sieves are shaken in a sieve shaker for about 30 minutes and the residue on each sieve is seighed separately.

For "very fine powder" a silk sieve No. 120 is used.

Determination of ash

(Ghṛta, Taila, Guggulu, Lepa, Bhasma, Sindūra, Piṣṭi, Kwātha cūrṇa, Cūrṇa, Vaṭi-guṭika, Rasa-yoga, Varti, Satva, Mandūra, Lauha.)

Method

Incinerate about 2 to 3 g. accurately weighted, of the prepared sample in a tared pletinum of silica dish at a low temperature until free from carbon, cool and weigh. If a carbon free ash cannot be obtained in this way extract the charred mass with hot water, collect the residue on an ashless filter paper, incinerate the residue and filter paper add the filtrate, evaporate to dryness and ignite to constant weight at a low temperature.

Calculate the percentage of ash with reference to the moisture free drug.

Acid insoluble ash

Boil the ash for 5 minutes with 25 ml of *dilute-hydrochloric acid* (6N) collect the insoluble matter in a Gooch crucilble., or on an ashless filter paper, wash with hot water and ignite to constant weight at a low temperature. Calculate the percentage of acid-insoluble ash with reference to the moisture free drug.

Water soluble ash

Boil the ash for 5 minutes with 25 ml of water; collect the insoluble matter in a Gooch crucible, or

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on an ashless filter paper , wash with hot water, and ignite to constant weight at a low temperature. Subtract the weight of the insoluble matter from the weight of the ash; the difference in weight represents the water soluble ash; Calculate the percentage of water soluble ash with reference to the miosture free drug.

Determination of Water Soluble Extractive

(Lepa, Cūrṇa, Satva)

Macerate 5 g. of the drug in coarse powder, with 100 ml of *chloroform water*, in a closed flask for twenty four hours, shaking frequently during six hours and allowing to stand for eighteen hours. Filter rapidly, taking precautions against loss of solvent, evaporate 25 ml of the filterate to dryness in a tared shallow bottomed dish, and dry at 100°C to constant weight.

Calculate the percentage of water-soluble extractive with reference to the moisture-free drug.

Determination of Alcohol-Soluble-Extractive

(Lepa,Cūrṇa, Sattva)

Proceed as directed for the *determination of water soluble extractive* using *alcohol* of the specified strength instead of *chloroform water*.

Loss on Drying

(Āsava, ariṣṭa, avaleha)

Note :

The B.P. method of drying at 105°C is not recommended for these preparations as they contain reducing sugar, the Laevulose moiety of which is decomposed at this temperature. The vacuum oven method is to be used. In this method the sample is spread on pure sand and dried in vacuo at 60-70 °C.

Method

Digest pure quartz sand that passes through No. 40 but not No. 60 sieve with hydrochloric acid, wash-acid free, dry and ignite. Preserve in stoppered bottle.

Place 25-30 g. of prepared sand and a short glass rod in a nickel or stainless steel dish, about 55 mm in diameter and 40 mm deep, fitted with a cover. Dry thoroughly, cover dish, cool in desiccator.

Pipette out a quantity of *āsava/ariṣṭa* to yield about 1 g. of dry matter. In the case of *avaleha* weigh sufficient quantity of the sample to yield about about 1 g. of dry matter in a dish, mix with a few ml. of water and transfer quantitatively to the dish containing prepared sand with the aid of water. Mix the sample thoroughly with the sand.

Dry at a temperature not more than 70°C under pressure not more than 50 mm. Hg making trial weighings at 2 hours intervals towards end of drying period until successive weighings do not differ by more than 2 mg. Calculate the total solids from the loss of weight on drying.

Note :

As dry sand, as well as dried sample, absorbs appreciable quantity of moisture on standing over most desiccating agents, make all weighings as quickly as possible after cooling in desiccator.

Determination of Alcohol content

(Āsavas and Ariṣṭas)

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Note : The B.P. method of quadruple bulk distillation is not suitable for preparations containing low percentages of alcohol as the alcohol percentage of the quadruple bulk distillate will be only ¼ that of the original prepartions. Specific gravity determinations of such dilute alcohol solution are likely to lead to inaccurate results.

It is preferable to use a method (*e.g. A. O. A. C.* method) in which the distillate is of the same strength as the original preparations. The alcohol tablets given in the *A.O. A. C.* should be used to obtain the alcohol content.

Method I : (in the absence of volatile oils).

Measure 100m. of the preparation in a graduated flask at 20°C(the flask may be immersed in ice water contained in a Dewar vessel, the temperature being maintained at 20°C by adding water or ice). Transfer to a flask of 500 to 800 ml capacity, wash the graduated flask with 50 ml of water, add the washings to the contents of the larger flask, and add a little pumice powder. Neutralise, if necessary, with sodium hydroxide solution. (This may be conveniently done by titrating an aliquot of the sample, after dilution, with N/10 sodium hydroxide using phenolphthalein solution as indicator, calculating the volume necessary to neutralise 100 ml and adding this amount of sodium hydroxide to the sample in the flask. Connect the flask to a condenser by means of a suitable still- head, and distil at least 90 ml into a 100 ml with water at the same termperature. Determine the specific gravity at 20°C, read off percentage of ethyl alcohol corresponding to the specific gravity from the appended table.

Method II : (in the presence of volatile oils)

Measure 100 ml of the sample in a graduated flask at 20°C. Transfer to a separator, wash the graduated flask with about 25 ml of water, add the washings to the contents of the separator, and add sufficient powdered sodium chloride to saturate the liquid. Add about 100ml of light petroleum (bioling point 40°C to 60°C), and shake vigorously for two to three minutes. Allow the mixture to stand for fifteen to thirty minutes and run the lower layer into a distillation flask. Wash the light petroleum in the separator by shaking vigorously with about 25 ml of sodium chloride solution allow to stand, and run the wash liquor into the first brine solution. Make the mixed solutions just alkaline N/1 sodium hydroxide using solid phenolphthalein as indicator, add a little pumice powder and 100 ml. of water, distil 90ml. and determine the amount of ethyl alcohol by Methoed I.

Determination of Fat content

(Avaleha, Ghṛta)

Transfer a weighed quantity of the well-mixed sample to an extraction thimble. Extract with anhydrous ether (petroleum ether, b.p. 40-60°C may be used if the fat is not to be used for any subsequent determinations; if fat values are to be determined, ether should be used) in a continuous extraction apparatus, for 6 hours. Filter the extract into a clean, dry weighed flask, wash the extraction flask with small quantities of ether, filter the washings into the weighed flask. Evaporate the solvent and dry to constant weight at 100°C.

Volatile oil content

(Arkā, ghṛta, taila, guggulu, vaṭī-guṭikā, and rasa-yoga, varti)

The determination is made by distilling the drug with water, collecting the distillate in a graduated tube in which the aqueous portion of the distillate is automatically separated and returned to the distilling flask, and measuring the volume of the oil. The content of volatile oil is expressed as a percentage v/w.

The apparatus consists of the following parts.

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a) Distilling flask: A spherical flask of 1000 ml capacity with a ground neck (standard joint B 34, British standard); taper of ground socket 1 to 10, internal diameter of larger end 34.35 to 34.65 mm.

b) Still – head, condenser, graduated measuring tube and return- flow tube made in one piece, in accordance with the following specification:

Group Joint A, accurately fitting in ground neck of flask taper 1 to 10, external diameter of smaller end 31.0 to 31.2 mm. minimum length of ground zone 34 mm.

Tube AC

Length 190 to 210 mm

Internal diameter 13 to 15mm.

Tube CDE

Length CD 145 to 155 mm.

Internal diameter 7 to 8 mm.

Condenser FG

Length 145 to 155 mm

Internal diameter 14 to 15 mm.

Internal diameter at constructions 9 to 10 mm.

Stopper K' and tubulure K

Taper 1 in 10

Nominal internal diameter of larger end of ground socket 7.5 mm.

Nominal external diameter of smaller end of ground cane 5.7 mm

Angle GHK 30^0 to 40^0

Tube GH

Internal diameter 7 to 8 mm.

Measuring tube JL

Length of graduated portion 145 to 155 mm capacity 4 ml. subdivided into 0.05 ml

Length HJ 30 to 40 mm

Tube BL

Internal diameter 7 to 8 mm.

Vertical height of junction B below tope graduation mark J 20 to 2 mm.

Distance between vertical axis 100 to 110 mm.

c) Burner : A luminous Argand- type burner with a chimney and sensitive regulating cap.

d) Stand ; a retort stand with asbesios covered ring and clamp carrying a piece of metal tubing N connected by a short length of rubber tubing, with the water inlet tube of the condenser jacket.

The whole apparatus is efectively screened from draughts. The glass apparatus is cleaned before each distillation by washing successively with acetone and water, then filling it to stand and finally rinsing with water.

When fully assembled the apparatus is totally enclosed. When an air – bent is required it should be arranged at the stopper K.

Method : (Proceed by Method I or II)

Method I : Mix a suitable quantity of the sample, accurately weighed or measured (solids should be

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reduced to powder form), with 30 ml of water and a few small pieces of porous earthern – ware in the distilling flask. Connect the flask to the stillhead remove the stopper K', and run water into the tubulure K until it overflows at B.

Heat the flask, with frequent agitation, until ebullition commences and continue. The distillation at a rate that leaves the lower part of the condenser cold at the point G.Rotate the flask occasionally to wash down any material adhering to the upper part of the walls. At the end of 4 hours, discontinue heating and after five minutes read off volume of volatile oil in the graduated portion of the tube.

Continue the distillation for a further period of one hour and again read off the volume of the oil. Repeat if necessary, until successive reading do not differ. The measured yield of volatile oil is taken to be the content of volatile oil in the drug.

Method II : Connect the distilling flask, containing 300 ml of water and a few pieces of porous earthernware to the still-head. Remove the stopper K' and run water into the tubulure K until it overflows at B. Introduce 1 ml of xylene at K by means of a pipette, the tip of which is inserted into the lower part of the tubulure K . Heat the flask until ebullition commences and continue the distillation at a rate that leaves the lower part of the condenser cold at the point G. After thirty minuttes read off the volume of xylene in the graduated portion of the tube.

Introduce the sample into the flask and carry out the distillation as described under method –I.

Subtract the volume of xylene previously observed from the volume of the oily layer; the remainder is taken to be the content of volatile oil in the dry sample.

Acid value

(ghṛta, taila , pāka)

Note : This determination should be carried out on the fat/ oil extracted from the sample by continuous extraction with ether.

The *acid value* of an oil or fat is defined as the number of milligrammes of potassium hydroxide required to neutralise the free acid in 1 gramme of the sample.

Method : Mix 25 ml ether with 25 ml of alcohol (95 percent) and 1 ml of 1 % phenolphthalein solution and neutrlise with N/10 alkali (few drops). Dissolve about 5gm of the fat or oil, accurately weighed in the mixed neutral solvent and titrate with N/10 potassium (or sodium) hydroxide, shaking constantly until a pink colour which persists for fifteen seconds is obtained.

(Alternatively, boiling neutral alcohol can be employed as solvent and the free fatty acids titrated while the liquid is still hot).

The titration should preferably not exceed about 10 ml.

The free fatty acid content is also express as F.F.A., calculated as oleic acid% (1 ml N/10) alkali= 0.028 g. oleic acid).

Saponification value

(Taila , ghṛta, pāka)

Note : This determination should be carried out on the fat/oil extracted from the sample by continuous extration with ether.

The *saponification value* of an oil or fat is defined as the number of milligrammes of potassium hydroxide required to neutralise the fatty acids resulting from the complete hydrolysis of 1 gramme of the sample .

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Alcoholic solution of potassium hydroxide : Dissolve 35-40 g. potassium hydroxide in 20 ml of water and dilute to one litre with alcohol(95%). Allow to stand overnight and decant off the pure liquid.

Method : Weight 2 g. of the oil or fat into a conical flask and add exactly 25 ml of the alcoholic potassium hydroxidde solution. Attach a reflux condenser and heat the flask in boiling water for one hour, shaking frequently. Add 1 ml of phenolphtnalein (1%) solution and titrate the excess alkali with N/2 hydro chloric acid (titration=a ml) carry out a blank at the same time (titration=b ml).

$$\text{Saponification Value} = \frac{(b-a) \times 56.1}{\text{Wt. (in g.) of sample}}$$

Iodine value

(Taila, ghṛta, pāka)

The *iodine value* of an oil or fat is the weight of iodine absorbed by 100 parts by weight of the sample, when determined by one of the following methods.

Method I : (Iodine Monochloride Method) (Wij's method)

Place the smaple, accurately weighed, in a dry iodine flask of 250 ml capacity, add 10 ml of carbon tetrachloride, and dissolve. (The approximate weight , in g. of the sample to be taken may be calculated by dividing 20 by the highest expected iodine value). Add 10 ml of chloroform and 20 ml of iodine monochloride solution, insert the stopper , previously moistened with potassium iodide solution, and allow to stand in a dark place at a temprerature of about 17°C for thirty minutes. Add 15 ml. of potassium iodine solution and 100 ml of water; shake and titrate with N/10 sodium thiosulphate using starch mucilage as indicator. Note the number of ml required (a). At the same time carry out the operation in exactly the same manner, but without the sample being tested, and note the number of ml. N/10 sodium thiosulphate required (b).

Calculate the iodine value from the formula

$$\text{Iodine Value} = \frac{(b-a) \times 0.01269 \times 100}{\text{Wt.(in g.) of sample}}$$

If (b-a) is greater than b/2 the test must be repeated using a smaller quantity of the sample.

Method II : (Iodine monobromide method) (Hanus method)

Iodobromide solutions : Dissolve 13.2 g. of iodine in 1000 ml of glacial acetic acid with the aid of gentle heat, if necessary cool the solution to 75°C and determine the oidine content in 20 ml. by titration with N/10 sodium thiosulphate. Add to the remainder of the solution a quantity of bromine equivalent to that of the iodine present . Store in glass containers, protected from light.

Place the sample, accurately weighed in a 250 ml iodine flask, add 10 ml of chloroform and dissolve (the approximate weight in g. of the sample to be taken may be calculated by dividing 20 by the highest expected Iodine number. Add 25 ml of iodobromide solution, stopper the flask, and allow it to stand for 30 minutes protected from light. Then add in the order named 1330 ml of potassium iodide solution, (16.5 per cent w/v) and 100 ml of water, and titrate the liberated iodine with N/10 sodium thiosulphate using starch mucilage as indicator, Note the number of ml required (a) . At the same time, carry out the operation inexactly the same manner, but without the sample being tested, and note the No. of ml. of *N-10 sodium thiosulphate required* (b) Calculate the iodine value from the formula.

$$\text{Iodine Value} = \frac{(b-a) \times 0.01269 \times 100}{\text{Wt. (in g.) of sample}}$$

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If (b-a) is greater than b/2 the test must be repeated using a smaller quantity of the sample.

Test for the absence of Vanaspati in ghee

The test is based on the presence of sesame oil Vanaspati, Vanaspati manufacturaed in India is statutorily required to contain 5 % of sesame oil. As the Baudouin's test described below is capable of detecting 0.5 % or less of sesame oil in other oil/fats, it is used indirectly for identification of vanaspati in ghee.

Shake 2 ml of the fat or oil with 1 ml of hydrchloric acid containing 1 % w/v of sucrose and allow to stand for 5 minutes, the acid layer acquires a pink colour.

Test for the detection of Arachis oil in sesame oil

Boil 1 ml of the oil with 5 ml of 1.5 N alcoholic potash (8.416 percent KOH in 95% alcohol) in a small flask fitted with a long air condenser for ten minutes. Add 50 ml of alcohol (70% v/v) and 0.8 ml of hydrochloric acid (specific gravity 1.16) and warm to dissolve any precipitate which may have formed, cool, stirring continuously with thermometer in the liquid, so that the temperature falls at the rate of about 1°C per minute.

The clouding points of sesame oil is 15°C and that of arachis oil 39-40°C . A figure significantly above 15°C test for the detection of cotton seed oil in other oils may be taken as evidence of the presence of arachis oil in sesame oil.

Thin Layer Chromatography

Thin layer chromatography (TLC) has been established and accepted as one of the most powerful exacting yet simple and useful tool for the modern chemist laboratory. The technique is relatively simple to understand and to perform, procedure is time-saving compared to other chromatographic procedures. Applicable to both volatile and non-volatile substances. TLC is useful in many fields, vitamins, steroids, harmones, pharmaceuticals, synthetic organic materials, dyes, esential oils, resins, pesticides, explosives, cosmetics, alkaloids, lipids etc. TLC also finds application in quantitative analytical fields.

Component of Thin Layer Chromatoset

A standared TLC Kit consists of 9 components namely perspex base, spreader (applicator), spotting template, TLC plates, micro pipette, scriber and glass sprayer with rubber bellow, developing tank with lid, plate rack.

Operating Guidelines

Preparation of Thin Layer on Plates by Applicator (Spreader)

There are so many ways of applying thin layers of powdered solids or their suspensions to carrier plates like pouring, dipping, spraying of adsorbent and spreading with the objective of obtaining uniform layer throughout the length of plates, applicator based on the design of 'DESAGA' W. Germany uses the best technique of spreading for coating TLC plates. With this applicator, the layer thickness can be adjusted from 0.0 to 2.0 mm with a minimum division of 0.25 mm. The spreader consists of an inbuilt reservoir for slurry. There is a plate with graduation marks between 0 to 2 mm in 0.25 division on it. One division on the plate gives 0.25 mm thickness. The coating thickness can be had by just moving the plate and any one division of the plates should just moving the plate and any one division of the plates should coincide with a mark on the body of the spreader. The screws of the plate should be tightened after setting the plate at the desired thickness.

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Preparation of Chromatoplates

In order to obtain better results, the glass plates must be thoroughly cleaned and completely free from gease. Scrub the plates with a scouring powder or immerse for several hours in sulphuric chromic acid mixture or a concentrated solution of sodium carbonate. This is followed by brushing under tap water and rinsing clean with distilled water. The cleaned plates are left to dry on a rack at room temperature. For coating the cleaned plates are placed in row with edges in alignment. For silica gel plates, 25g of silica gel (silica gel G, 200 mesh, 13% purified Plaster of paris as binder, silica gel GF 254 contains a florescence indicator upon exposure to ultraviolet light of 254 m/u) is shaken thoroughly with 50ml of distilled water in a 150ml flask fitted with a plastic stopper for 30 seconds. The spreader is placed on the perspex base over the glass plate at the right end to begin with. The reservoir is filled with slurry (silica gel or allumina) and the handle is turned so that the material comes on the plate. The spreader then moved in close contact of the perspex board towards left as shown by the arrow mark on the spreader. At the end, the handle of the spreader is turned up and then the spreader is removed. The plates will be coated with uniform thickness.

The spreader can coat plates of sizes 20x20cm, 20x10cm, 20x5cm.

The spreader should be cleaned after use.

The thickness of the layer is usually 0.25 mm except in preparative work where it may be as large as 2mm. Twenty five grams of silica gel suffices for three 20x20 cm. plates of 0.25 mm thickness.

Leave the prepared chromato plates on a level surface or on the template for superficial drying (about 15 minutes or until the surface of the layer become full), then separate and place the individual plates in a plate rack with guide rails and dry them in an oven for $1^1/_2$ hour at 110^0 C for activation. They are then ready for use or they may be transferred to a dessicator cabinet which contains 'Blue' silica gel as dessicant.

For alumina plates, 25g of aluminium oxide is shaken with 50ml of distilled water and handled as descirbed for silica gel plates. The final acivation depends upon the compounds to be separated. For highest activity, alumina plates require 4 hours at 135^0C followed by storage over blue silica gel or alumina of the required brockmann activity.

Basic silica gel layers are prepared by mixing silica gel with 0.1 N NaOH, sorensen buffer (pH 6.8) or 0.15 M sodium prepared by using 0.2 M oxalic acid or 2.5% (v/v) sulphuric acid solution is used for the separation of sugars and impregation with a 10% silver nitrate solution for the sepration of unsaturated compounds. The modified silica gel layers are best dried at room temprature overnight.

For layers containing on binder (such as silica gel H), great care must be taken not to shake the plate which is of necessity developed in a near horizontal position. Suspensions without a binder can be kept for quite a long time after preparation. They are not recommended for beginners.

Fluorescent plates can be prepared by using a 0.04% solution of fluorescein instead of water to prepare the slurry. Silica gel is available commercially with zinc silicate or other phosphors added.

Reversed-phase chromatoplates are prepared by immersing the adsorbent layer (on the plate) very slowly in a 5 or 10% solution of the impregnating agent (Parafin, silicone oil, undecane or n-tetradecane) in petroleum ether or diethyl ether. After removing the plate and evaporating the solvent the layer is ready for chromatography. Paraffin and silicon oil provide permanent impregnation whereas undecane can be removed after development by heating the plate for 45 minutes at 120^0 C.

Cellulose powder and ion exchange celluloses for thin layer chromatography adhere well to glass

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without a binder. Shake 10g of powder with 60ml. of distilled water for 30-45 seconds, homogenizing in a mixer is best. The suspension is spread on to the plates in the usual manner. Plates may be dried for one hour at 50^0 C or overnight at room temperature. They need not be stored in dessicator.

Choice of Adsorbent

In chromatography, we have to deal with system of at least three components-adsorbent, solvent and the compound being chromatographed. The behaviour of the compound depends upon both the adsorbent and the solvent.

While choosing adsorbents, one will be guided by the characteristics of the compounds to be separated. To begin with, some thought must be given to the solubility of the substance to be chromatographed i.e. whether it is hydrophilic (water soluble) or lipophilic (fat soluble).

Once the solubility of a compound is known it must be ascertained whether it has basic, acidic or neutral properties, or whether it is amphoteric. Finally, it must determined whether the compound is liable to react chemically with the adsorbent (or solvent) or whether chemical changes may occur due to the action of absorbent or binders.

Bearing the above considerations in mind many adsorbent have been developed namely alumina, aluminium silicate, bauxite, bentonites, calcium carbonate, calcium hydroxide, calcium oxalate, calcium silicate, calcium sulphate, di-calcium phosphate. fuller's earth, hydroxyi-apatit, kieselguhr, magnesia, magnesium silicate, silica gel, tri-calcium phosphate, water soluble salts, zinc carbonate, cellulose and a cetylated cellulose, charcoal and activated carbon, dextran gels, cellulose ion-exchange powder, ion-exchange resins, polyamide, polyethene powder, sucrose.

Choice of Solvent System

The choice of solvent or the mixture of solvent depends upon the nature of the process-whether the process is a case of adsorbtion or partition chromatography. In case of adsorption chromatography the solvent follows the rule of elutropic series, since the rate of migration of a compound on a given adsorbent depends upon the solvent used, the latter can arranged in order of elutive power.

Mixtures of two or three solvents of different polarity often give better separation than chemically homogeneous solvents. These solvents mixtures can also be arranged in elutropic series.

To get a general idea of elutive power of a solvent one can prepare a circular chromatogram on a thin layer plate.

Several spots of solution of the compounds to be separated are placed a few centimeters apart on the layer. When the solvent has evaporated, a thin capillary filled with the eluent is placed on the centre of each spot. As the solvent seeps out it spreads into a circle and, if is a suitable solvent, it separates the applied substances.

Spotting or substances

In applying the sample to thin-layer plate, there are certain techniques which must be practical in order to obtain the optimum resolution. The sample is applied as a solution as non-polar a solvent as possible, since the use of a polar solvent has a tendency to cause the starting spot to spread out and also may affect the Rf value of the compounds. The solvent used for dissolving the sample should be relatively volatile one, so that it may be removed easily from the plate before the development is started. The area of application should be kept as small as possible because the smaller the area of the application the sharper will be resolution. Usually, in order to keep the size of the spot small, a series of the

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applications is made by allowing the solvent to evaporate after each application or a stream of air may be directed at the sample spot. In the case of preparative work where the sample is applied in a narrow band, the width of the band should be kept as narrow as possible.

Prior to the sample application the starting point (13-20mm from the bottom edge) is marked and the finish line usually 10cm. from the application point is also marked. Great care must be taken in marking the starting line not to disturb the surface of the adsorbent as this causes distortion of the spots.

Template made from transparent perspex sheet contains a series of circles which permits the estimation of the areas of various size spots. It has sample application points marked at 10mm. intervals on one edge and at 15mm. intervals on the opposite edge. Holes drilled 10mm apart on each side of template are used to mark the limit of solvent travel and a horizontal slot ensures that the scriber cuts a straight line between these marks. The template is ruled at 5mm. intervals to facilitate the measurement of Rf values on developed plates.

Development of Thin Layer

The success of the separation and consequently the Rf values are greatly influenced by type and size of the glass developing tank used. The TLC kit includes a glass developing tank with lid suitable for 20x20 cm TLC plates. Smaller tanks for 20x10cm. and 20x5cm. plates are also available. It is excellent if the inside surface of these tanks is absolutely plain and flat but wer regret that such tanks are not available in India. So the tank supplied with the kit slightly curved from inside.

Condition for Development

Chamber saturation

It is clear that when the atmosphere in the tank is not saturated, solvent will climb up the firm and evaporate. Hence more solvent will pass through the film to carry the solvent front to a pre determined point than if the atmosphere was saturated. This in turn means that the Rf values are influenced by the degree of saturation of the atmosphere and effect will increase as the degree of saturation diminishes. Therefore, it is preferable to work with saturated tank, otherwise one might get so-called edge effect which results in giving different Rf values at the edges that at the middle of the plate. To ensure saturation, one can put a sheet of filter paper along the broad side of the tank and dipping in the solvent mixture. If several chromatographic plates are to be developed simultaneously in the same tank, Brenner & Niederwieser recommended that a sheet of solvent soaked filter paper should be clipped to the back of each plate. This problem of saturation has also been tried to be solved by confining the developing chamber to as small a size as possible.

Temperature, Light, Protection Against Oxidation

Work is usually carried out at room temperature (18-23^{0}C). It is important, however, when setting up separation chambers to ensure against heating on one side only, as even small temperature variations inside the tank, due to light, sunlight or a draught can give rise to an undesired ''Oblique formation'' of the solvant front.

In most cases work is done in diffuse daylight, sunlight should always be avoided. It is advisable to cover the inside of the window with antiglare foil which is impermeable to ultraviolet rays. A protective cover of black cardbord shold be set in an inverted position over the chamber in work with substances sensitive to light. Compounds that are exteremely sensitive to light should be applied in red or green light.

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Oxidizable compounds may decompose, during application if they are left on the active layer without solvent. This can be avoided as follows. The TLC plate is placed in a 'developer bowl' which, in turn is covered with a glass sheet. This sheet glass is perforated and through the hole a tube is passed and carbon dioxide or nitrogen fed through in order to apply the substance, the cover sheet is pushed back just enough to enable the starting point to be reached by the pipette. Some degree of protection against autoxidation can be obtained by previously moistening or spraying the starting zone with water.

Visualization

In the majority of cases, the substances are not immediately visible on the plate after the separation. Spraying of a chromatogram with a reagent in such cases changes the structure of the substance. Sometimes even the colours so obtained fade away so fast that further work on the plate is not possible. Such problems have been tackled in different ways with varying degrees of success.

An universal but simple method is that the developed chromatogram after drying is sprayed with distilled water. As long as the plate is wet the substances show up as white spots against a translucent background.

The use of fluroescent indicators has been of great help in preparative and quantitative separations. Organic compounds which absorb light in the UV range can be visualized by spraying the chromatograms with solutions of organic fluorescent dyes, UV-illumination, by adding inorganic fluorescent material to the adsorbent. In such cases UV absorbing substances can be recognized as dark spots on a florescent background when view in UV-light. Whereas spraying must be carried out most evenly to ensure a high sensitivity of detection.

The use of organic or inorganic florescent indicators like Barium di-phenylamine sulphonate, 2 : 7-Dichlorofluorescein, fluorescein (0.2% solution in ethanol), Morin (0/1% solution ethanol) sodium fluoresceinate (0.04% aqueous solution), rhodamine B, Zinc silicate, cadmium silicate and Methylumbelliferone, has been made for better visualization.

The visualization is done by looking at the TLC plate under an UV-lamp when substances show up as dark spots against a fluorescent background.

Basic Perceptions of "Quality"

1. Fitness to use: more or less fit for intended use.

by means of product sanctity.

by means of process sanctity.

by means of efficacy.

2. Ability to conform to prescribed standards:

organo-leptic standards.

standards of active medicament.

standards of dosage form

3. Ability to fulfill the user's expectations :

determined by a number of factors- ranging from High to acceptable

expectations on efficacy.

expectations on safety.

expectations on organo-leptic features.

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Essential components of "quality:" in a health – care product

Sanctity of Active ingredients
Physical sanctity
Chemical sanctity
Biological sanctity.
Fit-worthiness of processing materials
Storage conditions of both active & processing materials
Sanctity of processing
The processor-committed to the cause of quality.
Storage conditions of both active & processing materials
Sanctity of processing
The processor- Committed to the cause of quality
The processing environment conducive to the processes
The systems of pocessing that ensure an efective process.
A feed back mechanism.

Microbial –contamination limits in medicinal plant materials

Different limits are set according to the use of the material and the material itself.

a) Contamination of "crude" plant material intended for further processing (including additional decontamination by any physical or chemical process):

The limits* are given to untreated plant material harvested under acceptable hygienic conditions (These could possibly indicat problems occurring during handling practices and would need frther investigation):

per gram maximum 10^4 Escherichia coli
Maximum 10^5 mould propagules

b) Plant materials that have been pretreated (e.g. boiling water as used for herbal teas and infusions) or if the material is used for topical dosage forms:

Per gram maximum 10^7 aerobic bacteria.
Maximum 10^3 Saccaromycetes and Hyphomycetes
Maximum 10^2 Escherichia coli
Maximum 10^4 other enterobacteria
No Salmonellae

c) other plant materials for internal use :

per gram maximum 10^5 aerobic bacteria
maximum 10^3 Saccaromycetes and Hyphomycetes
maximum 10^1 Escherichia coli
maximum 10^3 other enterobacteria
no Salmonellae

(Limits adapted according to the "Provisional guidelines on the microbial contamination of spices, herbs and vegetable seasonings" , International consultative group on food irradiation, Consultation on

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microbiological criteria for foods to be further processed including irradiation , FAO, IAEA and WHO, Geneva 1989, WHO/EHE/FOS/89.5 , p.21).

Microscopic Characterization of powdered drug

Take a small amount of 40 # material and place it on 4 slides separately namely A,B, C, & D.

Slide-A : Mount the material with glycerin solution and observe the cell types and other internal structures.

Slide- B: Mount with double distilled water and observe the presence of strch granules. Irrigate the material with iodine solution (0.3 gm iodine, 1.5 gm. Potassium iodide in 100 ml water). Blue colour confirms the presence of starch granules

Slide-C: Add 2 drops of chloral hydrate solution and warm gently and repeatedly over a micro burner. Add two drops of chloral hydrate glycerol solution to avoid crystallization. Cover with a cover slip and oberve the presence of calcium oxalate crystals.

Slide-D : Add 2 drops of phloroglucinol solution followed by few drops of cone. Hydrochloric Acid. Apply a cover glass and observe. The lignified tissue stain red.

Slides	*Step I*	*Step II*	*Step III*	*Step IV*
A	Mount with glycerin sol.	Observe the cell structure		
B	Mount with double distilled water.	Observe the presence of starch grarues.	Irrigate with iodine sol.	Starch granules stain red
C	Add chloral hydrate sol.	Warm gently	Add chloral hydrate glycerol sol.	Observe calcium oxalate crystals.
D	Add phloroglucinol sol.	Add conc. HCl.	Lignified tissue stain red.	

Observations

Stellate hairs upto 8 branches are abundant.

Wavy epidermis is prominently present on the testa of the seed Reticulate thickenings in the secondary tissues is present.

(A reference line diagram of various microscopic components as visualized in thre sample is attached herewith).

Quality practices in pharmaceutical units of ISM:

Raw materials handling

3. Preventive/corrective measures :

De- dusting of the supply by manual or mechanical methods: & maintenance of records of weight/ Acid insoluble ash content.

Fumigation, if needed.

4. Storge;

Present practice : *stacking in Gunny bags.*

Preference : *in form of "coarse powders" stored in closed containers.*

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5. Maintenance of Appropriate recdords of all practices & RM release report.
6. Periodical pest/Rodent control measures in storage areas.

Process materials

1. Commonly used processing materials
a) Sugar-for syrups/Awalehas.
b) Jaggery- for Asavas/arishtas
c) Sesame oil-for Awlehas/Tailas.
d) Ghee for Awalehas/Ghritas.
e) Water for almost all products
f) Excipients for modern dosage forms.
2. Preferential options :
Sugar: Commercial grade, carbonated than Khandasari. Khandsari has variable sugar content.
Jaggery Sugar content should be taken into account
Sesame oil Un-refined. *Murchit Til tail* :
Process records of *Murchan vidhi*.
3. Preferential options : Ghee should conform to ISI specifications of Pure ghee, Pasteurized
Water : De- mineralized water should be mandatory.
Verification of DM systems.
Periodical check –up for bacteriological conformity
Excipients: (incl. Empty Gelatin capsules)
No restrictions on usage of excipients.
All excipients should be of Pharmacopoeia grade.

Concepts of GMP in ayurvedic literature

Guide line/recommendation : Inherent Objective :

a) Raw Drugs

Inspection & Identification :	Authenticity of collection.
Source of collection:	Biological & Chemical sanctity
Drying conditions /Storage:	Retention of chemical originality.

b) The processor

Mental worthiness:	Motivation to commitment.
Physical fitness:	Ability to handle the operations.
Personal hygiene:	Hygiene of process.

c) The Process

Weights & measurements.	Efficacy through accuracy
Process temperature:	Optimization of process
"In- process" examinations:	Process assurance.

d) The Product

Final examination :	Product assurance .
Storage & Stability :	Ability to exert the biological activity.

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Good Manufacturing Practices for Herbal Medicines

Processing Practices

1. Batch processing records & weighment sheets.
2. Prevention of product mix-up : highly critical.
3. Simulatineous weighment/measurements by two personnel.
4. Usage of clean/dry equipment tags.
5. In-process records of all process parameters.
6. Records of physical examination of produce inprocess.
7. Reports of in-process analysis; if any.

Processing areas

A. 1. Should be designed to offer an ease of process operations.
2. Adequate facility for drainage of wash waters/ effluents.
3. Platforms /elevations to facilitate a material handling
4. Necessary measures for safer operations.
5. Adequate thermal/pressure monitoring & controlling
6. Should conform to the factories act in general.
7. Extraction recovery systems – to minimize loss of extractable.
8. Marc-handling system –designed to cater the process needs completely.

Processing areas

B. 1.Dust- exhaust systems in powdering/disintegrating areas.
2. De-humidification systems in all selected areas;
3. Granulation/Tabletting
4. Capasules.
5. Churnas blending/packing
6. Bhasmas packing.

Covering process personnel

C. 1. Levels of motivation & training
2. Health & Personal hygiene: as per the norms of food precessing & pharmaceutical industries.

Processing areas

D. 1. Pre- packing inspection/analysis – at least for dosage form parameters.
2. A set of documents should be provided to final releasing authority.
3. Physical inspection of packing materials at issuing point.
4. Verification of statutory data on final labels.
5. On- chain verification of pack volumes/weights at random & maintenance of records.
6. Periodical validation of weights /measures

Developmental practices

1. Emphasis on Pre- formulation studies –approach/concept development.

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2. Formulation development & concurrent analysis.
3. Bio- batch development & evaluation.
4. Product/dosage form stability studies.
5. Package development & pack stability studies.

S. No.	Name of book	S. No.	Name of book
	Ayurveda	29.	Sarvaroga Chikitsa Ratnam
1.	Arogya Kalpadurma	30.	Sarvayoga Chikitsa Ratnam
2.	Arka Prakasha	31.	Sharangadhara Samhita
3.	Arya Bhishak	32.	Siddha Bhaishajya Manimala
4.	Ashtanga Hridaya	33.	Siddha Yoga Samgraha
5.	Ashtanga Samgraha	34.	Sushruta Samhita
6.	Ayurveda Kalpadruma	35.	Vaidya Chintamani
7.	Ayurveda Prakasha	36.	Vaidyaka Shabda Sindu
8.	Ayurveda Samgraha	37.	Vaidyaka Chikitsa Sara
9.	Bhaishajya Ratnavali	38.	Vaidya Jiwan
10.	Bharat Bhaishajya Ratnakara	39.	Basava Rajeeyam
11.	Bhava Prakasha	40.	Yoga Ratnakara
12.	Brihat Nighantu Ratnakara	41.	Yoga Trarangini
13.	Charaka Samhita	42.	Yoga Chintamani
14.	Chakra Datta	43.	Kashyapasamhita
15.	Gada Nigraha	44.	Bhelasamhita
16.	Kupi Pakva Rasayana	45.	Vishwanathachikitsa
17.	Nighantu Ratnakara	46.	Vrindachikitsa
18.	Rasa Chandanshu	47.	Ayurvedachintamani
19.	Rasa Raja Sundara	48.	Abhinavachintamani
20.	Rasaratna Samuchaya	49.	Ayurveda-ratnakar
21.	Rasatantra Sara Siddha Prayoga Samgraha	50.	Yogaratnasangraha
22.	Rasa Tarangini	51.	Rasamrita
23.	Rasa Yoga Sagara	52.	Dravyagunanighantu
24.	Rasa Yoga Ratnakara	53.	Rasamanijari
25.	Rasa Yoga Samgraha	54.	Bangasena
26.	Rasendra Sara Samgraha	54A.	Aurvedic Formulary of India 2[***]
27.	Rasa Pradipika	54B.	Aurveda Sara Sangraha]
28.	Sahasrayoga	54C.	Ayurvedic Pharmacopoeia of India]

6. Scale- up trails/circulation of bpr & specs.

Approaches of implementation

1. An informal surveillance of present status of GMP in the industry dealing in Herbal Medicines.
2. Organization of orientation pogrammes to facilitate committed impovements.
3. Constitution of a working group to design a specialized set of GMP norms, addressing Herbal Medicines.

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4. Finalization of a time frame- for phased implementation.

5. Mandatory imlementation of GMP code & development of newer norms.

The Drugs and Cosmetic Act, 1940

3 Definitions : In this Act, unless there is anything repugnant in the subject or context:

1 [(a) "[2][Ayurvedic, Siddha or Unani] drug " includes all medicines intended for internal or external use for or in the diagnosis, treatment, mitigation or prevention of [3][disease or disorder in human beings or animals, and manufactured] exclusively in accordance with the formulae described in the authoritative books of [4][Ayurvedic, Siddha and Unani Tibb systems of medicine] specified in the first Schedule;]

[5][(aa) "the Board" means-

(i)in relation to [2][Ayurvedic, Siddha or Unani] drug, the [6][Ayurvedic, Siddha and Uanani drugs Technical Advisory Board] constituted under Sec. 33-C; and

(ii) in relation to any other drug or cosmetic, the drugs Technical Advisory Board constituted under Sec; 5]

5[[7][(aaa)]" cosmetic" means any article intended to be rubbed, poured, sprinkled or sprayed on , or introduced into, or otherwise applied to , the human body or any part thereof for cleansing, beautifying , promoting attractiveness, or altering the appearance, and includes any article intended for use as a component of cosmetic, [8][**]

1[(h) "patent or proprietary medicine". means-

(i)in relation to Ayurvedic, Siddha or Unani Tibb systems of medicine all formulations containing only such ingredients mentioned in the formulae described in the authoritative books of Ayurveda, siddha or Unani Tibb Systems of medicine specified in the First Schedule, but does not include a medicine which is administered by parenteral route and also a formulation included in the authoritative books as specified in clause (a);

(ii) In relation to any other systems of medicine, a drug which is a remedy or prescription presented in a form ready for internal or external administration of human beings or animals and which is not included in the edition of the Indian Pharamacopoeia for the time being or any other Pharmacopoeia authorised in this behalf by the Central Government after consultation with the Drugs Technical Advisory Board constituted under section 5;]

CHAPTER IV-A

Provisions relating to [3][Ayurvedic, Siddha and Unani] Drugs

33-B. Application of Chapter IV-A – This chapter shall apply only to [2][Aurvedic, Siddha and Unani] drugs

33-C.Ayurvedic and Unani drugs Technical Advisory Board. – (1) The Central government shall, by notification in the Official Gazette and with effect from such date as many be specified therein, constitute a Board (to be called the [3][Ayurvedic, Siddha and Unani Drugs Technical Advisory Board]) to advise the Central Government and the State Governments on technical Matters arising out of this chapter and to carry out the other functions assigned to it by this chapter.

(2) The Board shall consist of the following members, namely:

(i) the Director- General of Health Services, ex officio;

(ii) the Drugs Controller, India , ex officio;

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4 [(iii) the principal officer dealing with Indian systems of medicine in the Ministry of Health, ex officio :]

(iv) the Director of the Central Drugs Laboratory, Calcutta, ex officio;]

(v) one person holding the appointment of Government Analyst under section. 33-F, to be nominated by the Central Government;

(vi) one Pharmacognocist to be nominated by the Central Government.

(vii) one Phyto-chemist to be nominated by the Central Government;

5 [(viii) four persons to be nominated by the Central Government, two from amongst the members of Ayurvedic Pharmacopoeia Committee,one from amongst the members of Unani Pharmacopoeia Committee and one from amongst the members of the Siddha Pharmacopoeia Committee;]

(ix) one teacher in Dravyaguna and Bhaishajya Kalpana, to be nominated by the Central Government;

(x) one teacher in ILM-UL-ADVIA and TAKLIS-WA-DAWÀ-SAZI, to be nominated by the Central Government;

3 [(xi) one teacher in Gunapadam to be nominated by the Central Government;

(xii) three persons, one each to represent the Ayurvedic, Siddha and Unani drug industry, to be nominated by the Central Government;

(xiii) three persons, one each from amongst the practitioners of Ayurvedic, Siddha and Unani Tibb systems of medicine to be nominated by the Central Government.]

(3) The Central Government shall appoint a member of the board as its Chairman.

(4) The nominated, members of the board shall hold office for three years, but shall be eligible for re-nomination.

(5) The board may, subject to the Previous approval of the Central Government, make bye- laws fixing a quorum and regulating its own procedure and conduct of all business to be transacted by it.

(6) The functions of the Board may be exercised not with standing any vacancy therein.

(7) The Central Government shall appoint a person to be secretary of the Board and shall provide the board with such clerical and other staff as the Central Government considers necessary.

1 [33-D. The Ayurvedic, Siddha and Unani Drugs Consultative Committee. – (1) The Central Government may constitute an Advisory Committee to be called the Ayurvedic, Siddha and Unani Drugs Consultative Committee to advise the Central Government, the State Governments and the Ayurvedic, Siddha and Unani Drugs Technical Advisory Board on any matter for the purpose of securing uniformity throughout India in the administration of this act in so far as it relates Ayurvedic, Siddha or Unani Drugs.

(2) The Ayurvedic, Siddha and Unani Drugs Consultative Committee shall consist of two persons to be nominated by the Central Government as representatives of that Government and not more than one representative of each State to be nominated by the State Government concerned.

(3) The Ayurvedic, Siddha and Unani Drugs Consultative Committee shall meet when required to do so by the Central Government and regulate its own procedure.

33-E. Misbranded drugs- for the purposes of this chapter, an Ayurvedic, Siddha and Unani Drug shall be deemed to be misbranded-

(a) if it is so coloured, coated, powdered or polished that damage is concealed, or if it is made to appear of better or greater therapeutic value than it really is; or

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(b) if it is not labelled in the prescribed manner; or

(c) if its label or container or anything accompanying the drug bears any statement, design or device which makes any false claim for the drug or which is false or misleading in any particular.

33-EE. Adulterated drugs- for the purposes of this chapter, an Ayurvedic, Siddha and Unani Drug shall be deemed to be adulterated-

(a) if it consists, in whole or in part, of any filthy, putrid or decomposed substance; or

(b) if it has been prepared, packed or stored under insanitary conditions whereby it may have been contaminated with filth or whereby it may have been rendered injurious to health; or

(c) if its container is composed, in whole or in part, of any poisonous or deleterious substance which may render the contents injurious to health; or

(d) if it bears, or contains, for purposes of colouring only, a colour other than one which is prescribed; or

(e) if it contains any harmful or toxic substances which may render it injurious to health; or

(f) if any substance has been mixed therewith so as to reduce its quality or strength.

Explanation- For the purpose of clause (a), a drug shall not be deemed to consist, in whole or in part, of any decomposed substance only by reason of the fact that such decomposed substance is the result of any natural decomposition of the drug.

Provided that such decomposition is not due to any negligence on the part of the

manufacturer of the drug or the dealer thereof and that it does not render the drug injurious to health.

33-EEA. Spurious drugs- for the purposes of this chapter, an Ayurvedic, Siddha and Unani Drug shall be deemed to be spurious-

(a) if it is sold, or offered or exhibited for sale, under a name which belongs to another drug; or

(b) if it is an imitation of, or is a substitute for, another drug or resembles another drug in a manner likely to deceive or bears upon it or upon its label or container the name of another drug, unless it is plainly and conspicuously marked so as to reveal its true character and its lack of identity with such other drug; or

(c) if the label of container bears the name of an individual or company purporting to be the manufacturer of the drug, which individual or company is fictitious or does not exist; or

(d) if it has been substituted wholly or in part by any other drug or substance; or

(e) if it purports to be the product of a manufacturer of whom it is not truly a product.

33-EEB. Regulation of manufacture for sale of Ayurvedic, Siddha and Unani Drugs- No person shall manufacture for sale or for distribution of any Ayurvedic, Siddha and Unani drug except in accordance with such standards, of any, as may be prescribed in relation to that drug.

33-EEC.Prohibition of manufacture and sale of certain Ayurvedic, Siddha and Unani drugs- From such date as the State Government may, by notification in the Official Gazette, specify in this behalf no person, either by himself or by any other person on his behalf, shall-

(a) manufacture for sale or for distribution-

(i)any misbranded, adulterated or spurious Ayurvedic, Siddha and Unani drugs;

(ii) any patent or proprietary medicine, unless there is displayed in the prescribed manner on the

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label or container thereof the true list of all the ingredients contained in it; and

(iii) any Ayurvedic, Siddha and Unani drugs in contravention of any of the provisions of this chapter or any rule made there under;

(b) sell, stock or exhibit or offer for sale or distribute any Ayurvedic, Siddha and Unani drugs, which has been manufactured in contravention of any of the provision of this act, or any rule made thereunder;

(c) manufacture for sale or for distribution, any Ayurvedic, Siddha and Unani drugs, except under and in accordance with the conditions of, a license issued for such purpose under this chapter by the prescribed authority:

Provided that nothing in this section shall apply to *vaidyas* and hakims who manufacture *Ayurvedic*, *Siddha* and Unani drugs for the use of their own patients.

Provided futher that nothing in this section shall apply to the manufacture, subject to the prescribed conditions of small quantities of any Ayurvedic, Siddha and Unani drugs for the purpose of examination, test or analysis.

33EED. Power of Central Government to prohibit manufacture, etc., of Ayurvedic, Siddha or Unani drugs in public interest– Without prejudice to any other provision contained in this Chapter, if the Central Government is satisfied on the basis of any evidence or other material available before it that the use for any Ayurvedic, Siddha or Unani drug is likely to involve any risk to human beings or animals or that any such drug does not have the therapeutic value claimed or purported to be claimed for it and that in the public interest it is necessary or expedient so to doe then, that Government may, by notification in the Official Gazette, prohibit the manufacture, sale or distribution of such drug.

33F. Government Analysts– (1) The Central Government or a State Government may, by notification in the Official Gazette, appoint such persons as it thinks fit, having the prescribed qualifications, to be Government Analysts for such areas as may be assigned to them by the Central Government or the State Government, as the case may be.

(2) Notwithstanding anything contained in sub-section (1), neither the Central Government Analyst any official not serving under it without the previous consent of the Government under which he is serving.

[1][(3) No person who has any financial interest in the manufacture or sale of any drug shall be appointed to be a Government Analyst under this section.]

Comments - The opinion of an Analyst, not recognised under section 33F, cannot be relied upon, whatever may be his qualifications; *State V. Rajamani,* 1982 Cri LJ (NOC) 71.

33G. Inspector– (1) The Central Government or a State Government may, notification in the Official Gazette, appoint such persons as it thinks, fit, having the prescribed qualifications, to be Inspectors for such areas as may be assigned to them by the Central Government or the State Government as the case may be.

(2) The powers which may be exercised by an Inspector and the duties which may be performed by him and the conditions, limitations or restrictions subject to which such powers and duties may be exercised or performed shall be such as may be prescribed.

(3) No person who has any financial interest in the manufacture or sale of any drug shall be appointed to be an Inspector under this section.

(4) Every Inspector shall be deemed to be a public servant within the meaning of section 21 of the

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Indian Penal Code (45 or 1860) and shall be officially subordinates to such authority as the Government appointing him may specify in this behalf.)

(i) Deemed to be adulterated under Section 33EE.

[3][The First Schedule]

[See section 3(a)]

[4][A.–AYURVEDIC AND SIDDHA SYSTEMS]

33- H; Application of provisions of Sections, 22,23,24 and25- The provisions of Sections.22, 23,24 and25 and the rules ,if any, made thereunder shall, so far as may be, apply in relation to an Inspector, and a Government Analyst appointed under this chapter as they apply in relation to an Inspector and a Government Analyst appointed under this chapter as they apply in relation to an Inspector and a Government Analyst appointed under Chapter IV , subject to the modification that the references to : drug: in the said sections, shall be construed as references to [1][Ayurvedic, Siddha or Unani] drug.

[2][33 –I Penalty or manufacture, sale, etc. of Ayurvedic , Siddha or Unani drug in contravention of this chapter. Whoever himself or by any other person on his behalf-

(1) manufactures for sale or for distribution,

(a) any Ayurvedic, Siddha or Unani drug-

without a valid licence as required under Cl.(c) of Sec. 33-EEc,

shall be punishable with imprisonment for a term which may extend to one year and with fine which shall not be less than two thousand rupees,

(b) any Ayurvedic, Siddha or Unani drug deemed to be spurious under Sec. 33 EEA, shall be punishable with imprisonment for a term which shall not be less than one year but which may extend to three years and with fine which shall not be less than five thousand rupees.

Provided that the Court may, for any adequate and special reasons to be mentioned in the judgment, impose a sentence of imprisonment for a term of less than one year and of fine of less than five thousand rupees; or

(2) contravenes any other provisions of this chapter or of Sec. 24 as applied by Sec. 33-H or any rule made under this chapter, shall be punishable with imprisonment for a term which may extend to three months and with fine which shall not be les than five hndred rupees.

33-J, Penalty for subsequent offences. – Whoever having been convicted of an offence-

(a) under Cl. (a) of sub section (1) of Sec. 33-I is again convicted of an offence under that clause, shall be punishable with imprisonment for a term which may extend to two years and with fine which shall not be less than two thousand rupees;

(b) under Cl.(b) of su section (1) of Sec. 33-I is again convicted of an offence under that clause, shall be punishable with imprisonment for a term which shall not be less than five thousand rupees:

Provieded that the Court may, for any adequate and special reasons to be mentioned in the judgment, impose a sentence of imprisonment for a term of less than two years and of fine of less than five thousand rupees.

(c) under subsection (2) of Sec. 33-I is again convicted of an offenceunder that sub-section, shall bepuisable with imprisonment for a term which may extenc to six months and with fine which shall not be less than one thousand rupees.]

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33-K Confiscation- where any person has been convictedunderthis chapter, the stock of the 2 (Ayurvedic, Siddha or Unani] drugs, in respect of which the contravention has been made, shall beliable to confiscation.

33-L Application of provisions to Government departments.-The provisions of this chapter except those contained in sec. 33-K shall apply in rlation th the manufacture for sale, sale, or distribution of any 2 [Ayurvedic Siddha or Unani] drug by anydepartment of Governmentas they apply in relation to the manufacture for sale, sale or distribution of such drug by any other person.

33-M Cognizance of offences- (1) No prosecution under this chapter shall be instituted except by an Inspector 3[with the previous sanction o the authority specified under sub section (4) of Sec. 33.G]

(2) No court inferior to that 4 [of a Metropolitan Magistate or of a Judicial Magistrate of the firs class] shall try an offence punishable under this chapter.

33-N Power of Central governmentto make rules –(1) The Central Governmentmay, 5 [after consultation with, or on the recommendation of , the Board] and ater previous publication by notification in the official Gazette, make rules of the purpose of giving effect to the provisions of this chapter.

Provided that consultation with the Board may be dispensed with if the central Government is of opinion that circumstances have arisen which render it necessary to make kules without such consultation, but in such a case, the Board shall be sonsulted within six months of the making of the rulesa and the Cebntral Government shall take into consideration any suggestions which the Board may make in relation to the amendment of the said rules.

(3) without prejudice to the generality of the oregoing power, such rules may-

(a) provide for the extablishment of laboratories for testing and anlysing 1[ayurvedic, siddha or unani] drugs.

(b) Prescribe the qualifications and duties of Government Analysts and the qualifications of Inspectors;

(c) Prescribe the methods of tests or analysis to be employed indetermining whether any 1[Ayurvedic, Siddha or Unani] drug is labelledwith the true list of the ingredients which it is purported to contain;

(d) Specify any substance as a poisonous substance;

(e) Prescribe the forms of licences for the manufacture for sale of 1[ayurvedic, Siddhor Unani] drugs 2 [and for sale of processed Ayurvedic, siddha or unani drugs] the form of application for such licences, the conditions subject to which such licences may be issued, the, authority empowered to issue the same and the fees payable therefore 2 [and provide for the cancellation or suspension of such licences in any case where any provisions of this chapter or rules made thereunder is contravened or any of the conditions subject to which they are issued is not complied with]

[3][(f) prescribe the conditions to be observed in the packing of Ayurvedic, Siddha and Unani dugs including the use of packing material which comes into direct contact with the drugs, regulate the mode of labeling packed drugs and prescribe the matters which shall or shall not be included in such labels]

(g) prescribe the conditions subject to which small quantities of 1 [Ayurvedic, Siddha or Unani] drugs may be manufactured for the purpose of examination, test or analysis.

4 [(gg) prescribe under Cl. (d) of Sec. 33-EE the colur or colours which an Ayurvedic, Siddha or Unani dug may bear or contain for purposes of colouring.

(gga) Prescribe the standards for Ayurvedic, Siddha or Unani drugs under section 33EEB;] and

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(h) any other matter which is to be or may be prescribed under this chapter.

33-O. Power to amend First Schedule–The Central Government, after consultation with the Board and after giving, by notification in the Official Gazette, not less than three months notice of its intention so to do, may, by a like notification, add to or otherwise amend the First Schedule for the purposes of this Chapter and thereupon the Schedule shall be deemed to be amended accordingly.]

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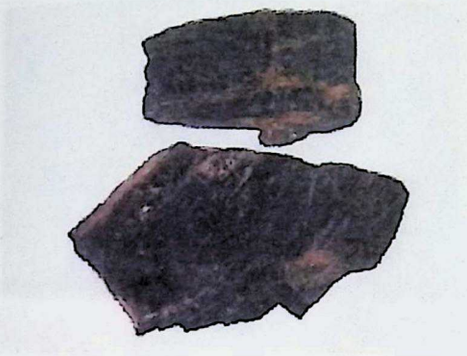
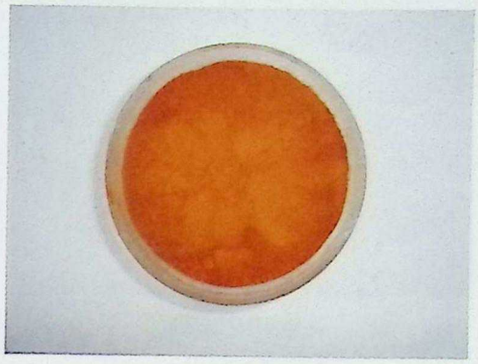
Maharas

The Relevant Photographs of Different Drugs Commonly Used for Preparation of Different Bhasma etc. and wherever required the intermediatory and finished product photographs on the basis of their importance in identification is mentioned below :



Krisnabhraka

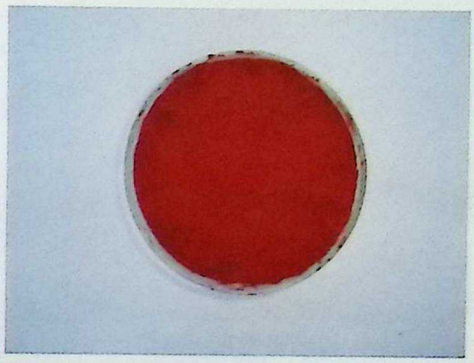
Sodhita Krisnabhraka
(After Dhanyabhraka Vidhi)



Abhraka Bhasma

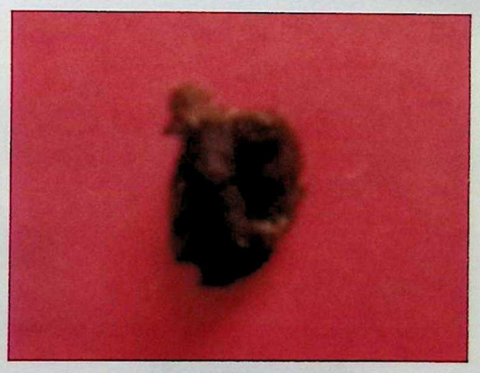
Vaikranta

Swarnmakshika

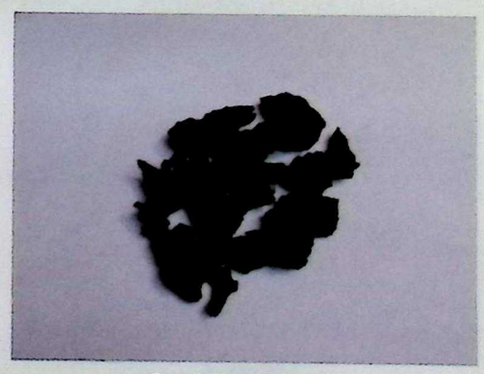


Swarn Makshik Bhasma

Vimala



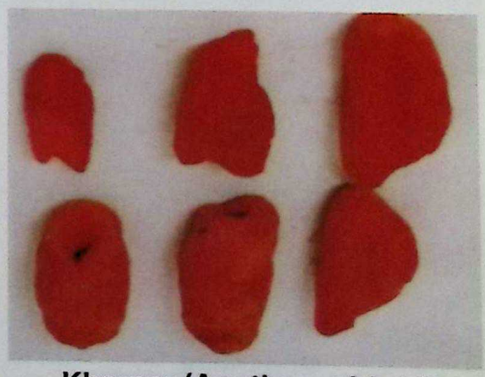
Shilajit



Suddha Silajit

Tutha

Kharpar



Kharpar (Another vairiety)

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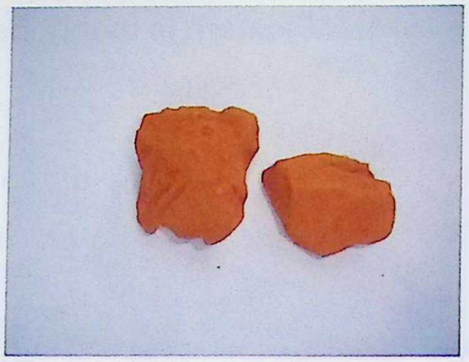
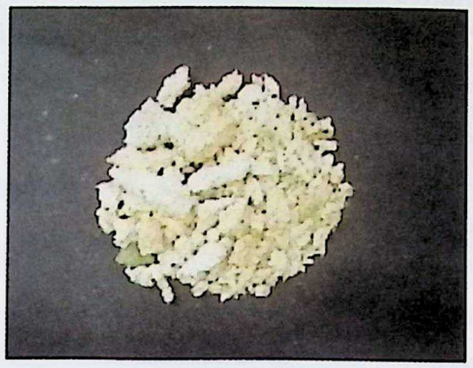
Upa Ras

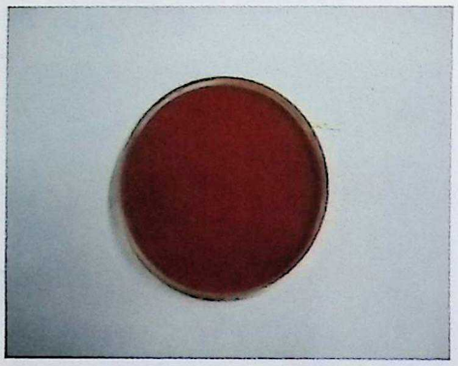
Gandhak



Gairika



Kasis



Kasis Bhasma

Sphatika

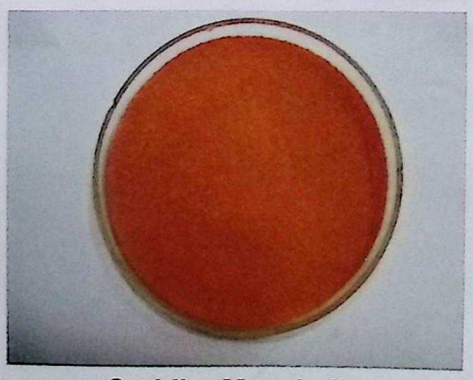
Sphatika Bhasma

Haratal

Suddha Hartal

Rasamanikya

Manahsila



Suddha Manahsila

Kankustha

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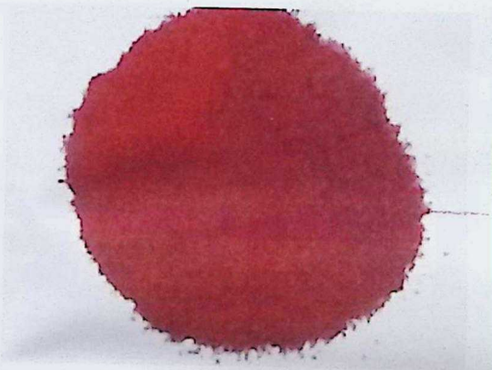
Uprasa-Sadharan Ras - Mercurial Products

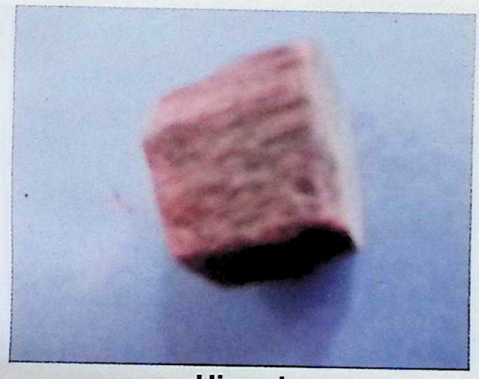
Nilanjan

Swetanjana

Rasanjana



Kampillak



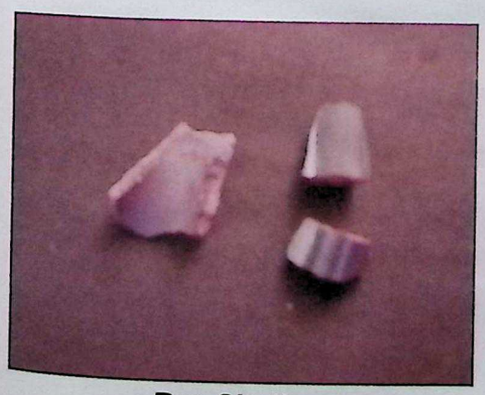
Hingul

Suddha Hingul

Mriddarasringa

Navasadara

Kajjali



Ras Sindhur

Swarna Vang

Hema Garbha Pottali

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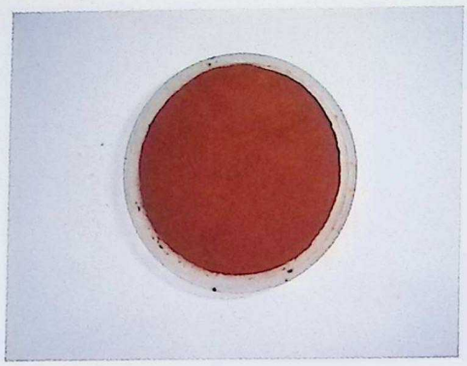
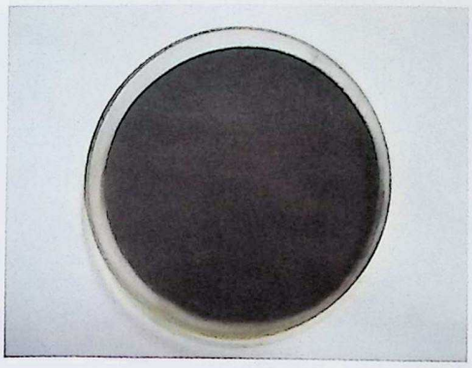
Dhatu

Rajata Bhasma



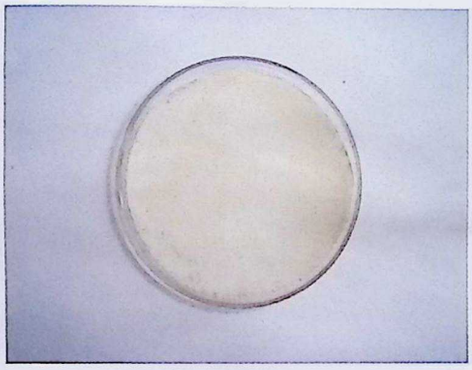
Loha Bhasma



Tamra Bhasma

Vang

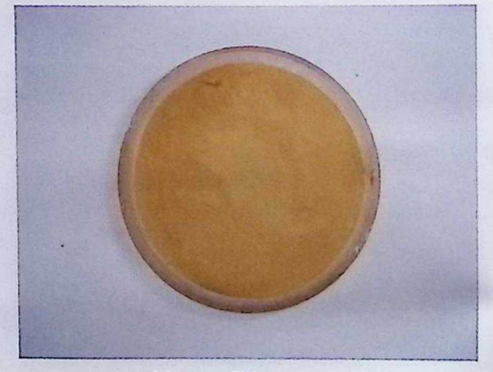
Suddha Vang



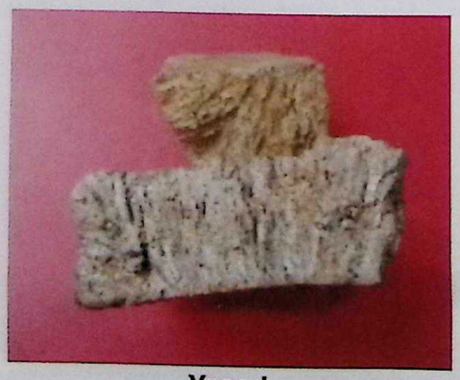
Vang Bhasma

Nag

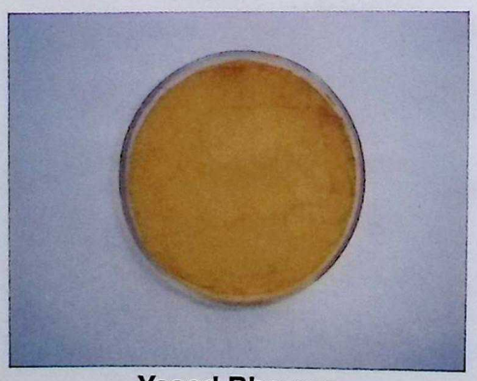
Suddha Nag



Naga Bhasma



Yasad



Yasad Bhasma

Mandur Bhasma

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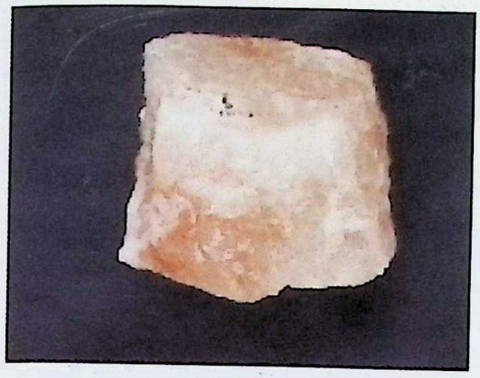
Lavana-Kshara-Sikata-Ratna Varga

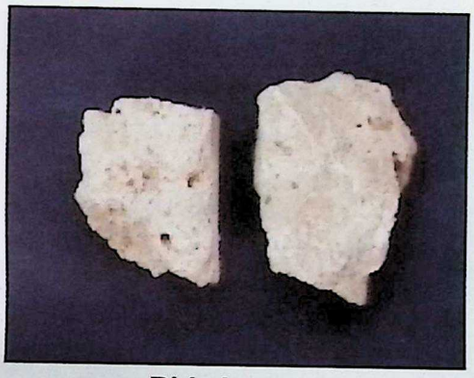


Saindhava Lavana

Sauvarchala Lavana

Samudra Lavana

Sambhar Lavana



Bida Lavana

Sudha

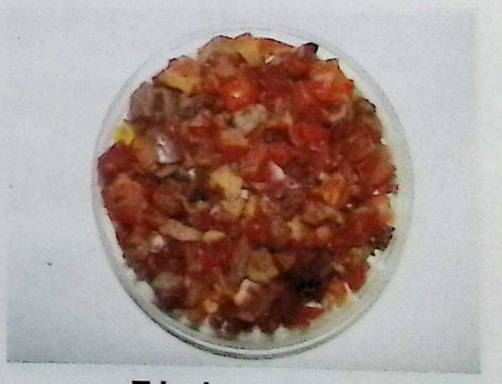
Dugdha Pashana

Badarasma

Nagapashana

Manikya Bhasma

Chandrakant



Trinakantamani

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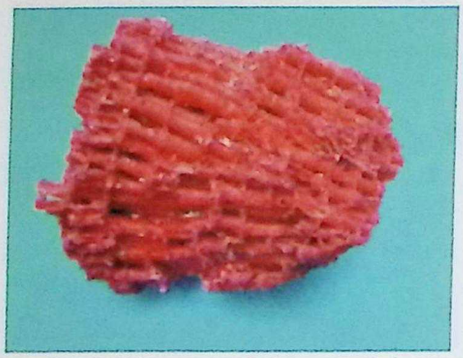
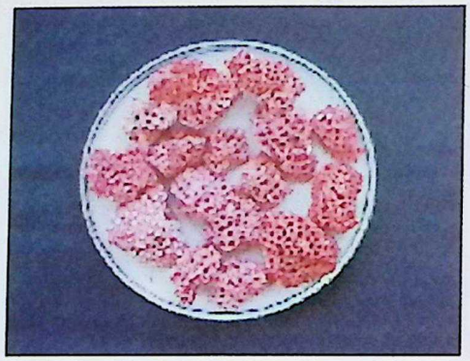
Sudha Varg

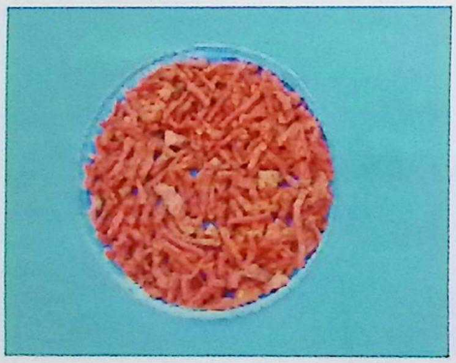


Pravala moll raw material



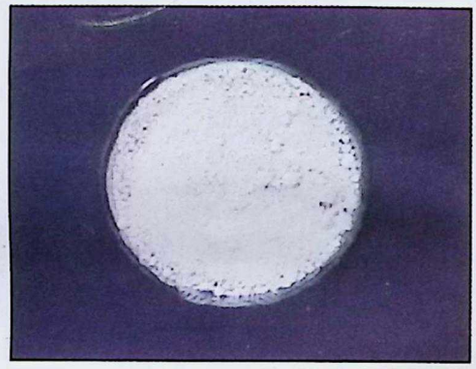
Pravala moll after Shodhana

Pravala moll bhasma



Pravala Shankha Raw Material

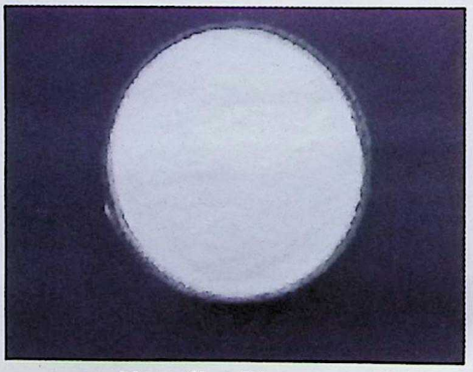
Pravala Shankha After Shodhana



Pravala Shankha Pisti

Varatika Raw Material

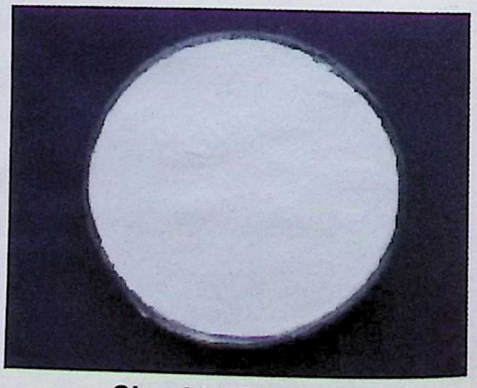
Varatika After Shodhana



Varatika Bhasma

Shankha Raw Material

Shankha after Shodhana



Shankha Bhasma

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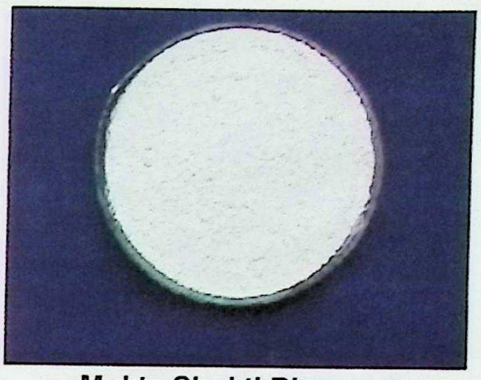
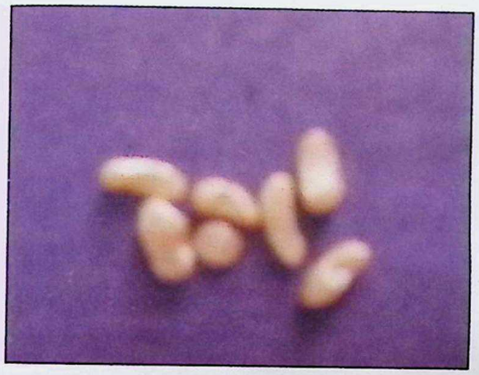
Sudha Varg-Animal Products-Kshara (Tankana)

Mukta Shukti Raw Material

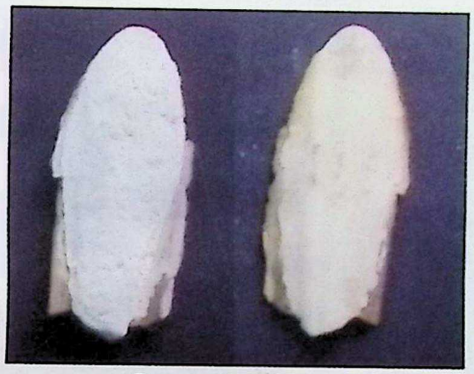
Mukta Shukti After Shodhana



Mukta Shukti Bhasma



Mukta



Samudraphena

Mrigasringa

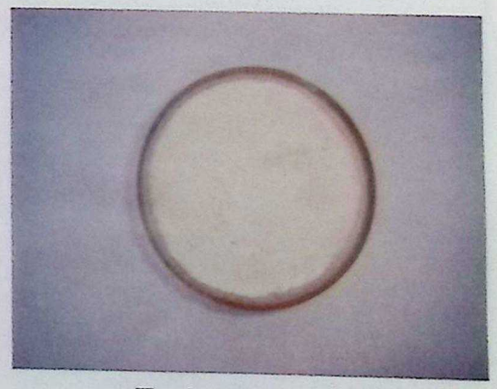
Kasturi

Mayur Pankha Bhasma

Godanti

Godanti Bhasma

Tankan



Tankan Bhasma

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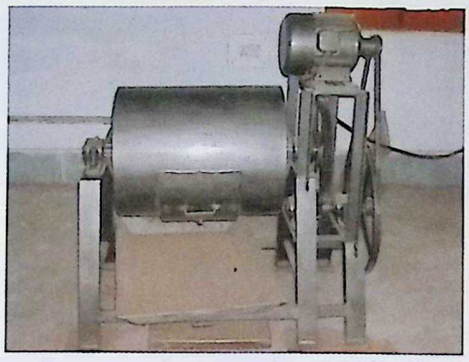
Different Machinery/Equipment used in the preparation of different Ayurvedic medicines are mentioned below :

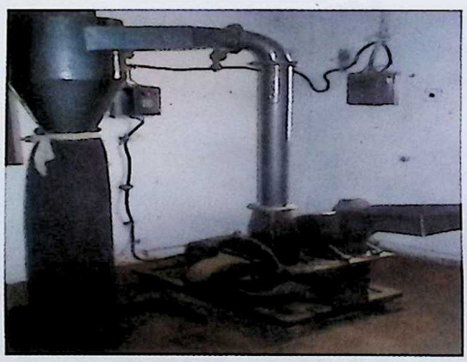
Vertical Electric Furnace Used for preparing, Rasasindur, Swarna Vanga etc. Kupipakwa Rasaushadhi

Electric Furnace Used for preparing, Bhasma

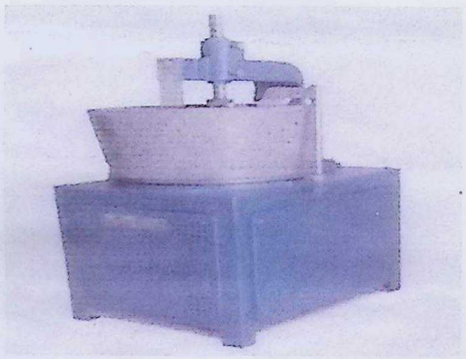


Ball Mill used for Crushing hard materials like saindhva lavana, tankana etc.

Disintegrator used for Preparing Kwatha Churna



Pulveriser used for Preparing Fine Powders (Churna)



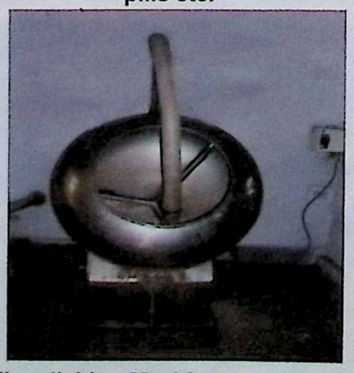
End Runner having Mortar and pestle made with granite stone used for preparing paste of Guggulu etc.

Machanised Kharal having Mortar and pestle made with granite stone used for bhavana etc. of different drugs

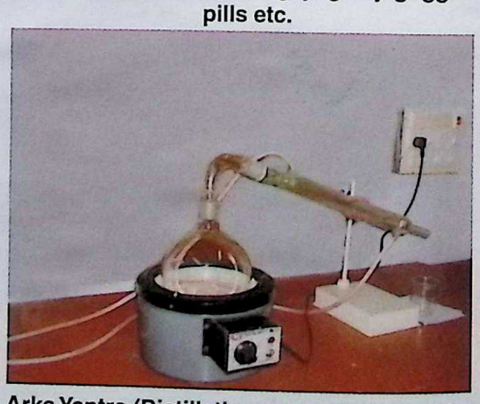
Pill Thread making Machine used for preparing pill threads of yogarajagugglu pills etc.

Pill Cutting Machine used for preparing pills of different size, e.g. yogarajagugglu pills etc.

Pulpur used for extracting fine pulp from boiled Amalaki



Pill polishing Machine used to polish different varieties of pills



Arka Yantra (Distillation apparatus) used for preparing different varieties of arka

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Lotions 660

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Born in a small town Kavali in Nellore dist.(Andhra Pradesh), in the family of traditional farmer, he gradually acquired highest degrees **BAMS, M.D., Ph.D., H.P.A.Edu., CLAD (JAPAN)** in *Āyurveda* pertaining to *Rasaśastra* and *Bhaiṣajya Kalpanā* From various Universities of India and Abroad. Five books and a good number of research papers are published in the credit of Dr. K. Rama Chandra Reddy.Which are referred by BAMS, M.D. students of *Āyurveda*, various research scholars and persons working in *Āyurvedic* Drug Industries. Dr. K. Rama Chandra Reddy is well known for his valuable contribution in the field of *Āyurveda,* pertaining to *Āyurvedic Pharmaceutics* (*Rasaśāstra* and *Bhaiṣajya Kalpanā*). During the last 13 years he has written on various aspects of *Rasaśāstra* and *Bhaiṣajya Kalpanā*—literary, scientific, conceptual as well as practical aspects of *Āyurvedic* drug manufacturing. He is appointed as a Head for the Deptt. of *Rasaśāstra* and *Bhaiṣajya Kalpanā* in NKJ *Āyurvedic* medical college, Bidar (Karnataka) and then he is appointed as a Head for the dept. of *Rasaśāstra* and *Bhaiṣajya Kalpanā* in S.D.M. College of *Ayurveda*, Hassan (Karnataka), further he is also worked as Asst. Professor Deptt. of *Rasaśāstra* and *Bhaiṣajya Kalpanā* & Manager- Pharmacy in National Institute of Ayurveda, Jaipur, at present he is working as a Head, Deptt. of *Rasaśāstra* & Superintendent, *Āyurvedic Pharmacy*, Faculty of *Āyurveda*, Institute of Medical Sciences, B.H.U.Varanasi. By working in various prestigious Universities in India and Abroad Dr. Reddy has aquired best knowledge in his concerned field. Dr. Reddy has been produced many Post Graduate thesis works and also guiding many Ph.D. thesis works in the concerned subject. Dr. K. Rama Chandra Reddy has been awarded by the pristegios *Vaidyaratna* Capt. G. Srinivasa Murthy Scientist Award and Gold Medal by Academy of *Āyurveda* (A Research Institute), Vijayawada. He is actively participating in different national and international conferences related to *Rasaśāstra* and *Bhaiṣajya Kalpanā*.

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